

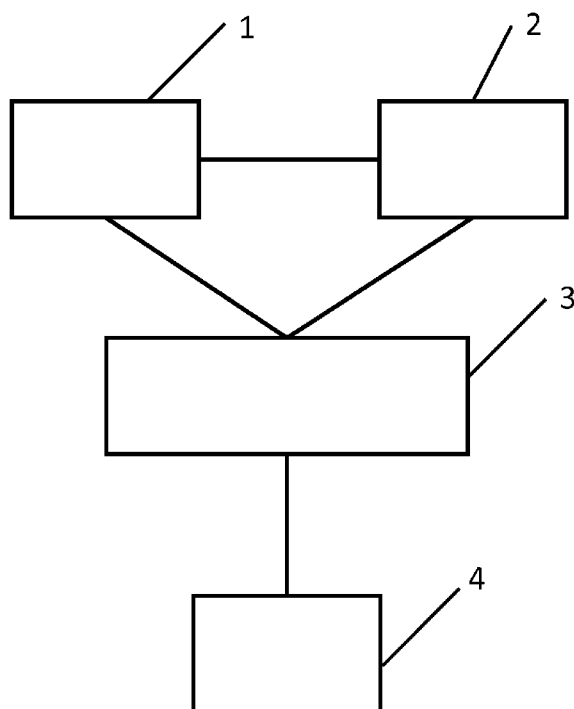


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(54) **Title:** MATHEMATICAL MODEL AND SCORE FOR PREDICTING THE PRESENCE OF PAROXYSMAL ATRIAL FIBRILLATION

Fig. 1



(57) **Abstract:** The present invention refers to a method for predicting paroxysmal atrial fibrillation in a subject. Furthermore, the present invention refers to a system allowing the prediction of paroxysmal atrial fibrillation.



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MATHEMATICAL MODEL AND SCORE FOR PREDICTING THE PRESENCE OF PAROXYSMAL ATRIAL FIBRILLATION

The present invention refers to a method for predicting paroxysmal atrial fibrillation in a subject. Furthermore, the present invention refers to a system allowing the prediction of paroxysmal atrial fibrillation.

Atrial fibrillation (AF) is the most frequent rhythm disorder, and its prevalence is expected to further increase due to demographic transition [1]. In some cases, AF is firstly diagnosed after a stroke or a transient ischemic event. For this reason, early diagnosis of AF episodes is essential. In particular, paroxysmal AF (pAF) often remains unobserved, in contrast to chronic AF (cAF), and is a frequent cause of cryptogenic ischemic stroke [2–5]. Further optimization of easy implementable non-invasive methods for pAF detection represents an important task for translational electrophysiological research, as recently declared in the EHRA roadmap to improve the quality of atrial fibrillation management [4].

Traditionally, surface electrocardiogram (ECG) is the basic method for AF diagnosis. Holter ECG monitoring is used to detect pAF [6]. In addition, intra-cardiac ECG measured with cardiac device electrodes or catheter electrodes during ablation procedures is used for AF detection. Risk stratification tools were established for the prevention of stroke, transient ischemic attacks or other thromboembolic complications. In particular, the CHADS₂ and CHA₂DS₂-VASc scores are part of the common clinical practice for guiding prophylactic anticoagulation therapy [6]. It can be expected that, within the context of the evolving area of systems medicine, further predictive models will be developed, which integrate clinical parameters from different diagnostic techniques, to predict the individual risk for the development of pathologies and can be used to optimize personalized therapies.

Previous studies have analyzed the pathophysiological involvement of echocardiographic parameters that reflect hemodynamic alterations in the development of AF, in order to improve the risk assessment of individual patients for developing AF. Patients with non-rheumatic atrial fibrillation showed left atrial (LA) enlargement, increased left ventricular (LV) wall thickness, and reduced end-diastolic to end-systolic fractional shortening of the LV [7]. It was shown that at a higher age, echocardiographic measures of the diastolic function are significantly associated with an increased risk of AF [8]. Left ventricular dysfunction and LA size were shown to be predictive for thromboembolic events in patients with non-valvular AF [9].

Implantable cardiac monitors were developed, which can be implanted in subjects who once suffered from a stroke of unknown cause. Said cardiac monitors allow continuously recording the heart rhythm for the following three years. Abnormalities are registered within certain time intervals. When the monitor is read out, abnormalities can be diagnosed by the doctor in charge. Thus, in the case of atrial fibrillation the patient can be treated accordingly in order to prevent any further strokes caused by atrial fibrillation. In particular, for pAF patients such a monitor would be useful since only by continuous observation these randomly occurring fibrillations can be detected. However, also the usage of such an implantable monitor would be associated with a surgical intervention besides high costs for the device.

This clearly demonstrates that there is a need for providing a method in order to predict pAF. While cAF can easily be detected, pAF often remains unobserved.

Therefore, one object of the present invention is to provide a method for easily and reliably predicting paroxysmal atrial fibrillation in a subject.

Another object of the present invention is to provide a system for predicting paroxysmal atrial fibrillation in a subject.

The objects are solved by a method and a system according to the independent claims. Preferred embodiments of the invention are defined in the corresponding subclaims.

According to the first aspect of the present invention a method is provided for predicting paroxysmal atrial fibrillation comprising

- i) the step of determining at least the following parameters of a subject:
 - a) age, and
 - b) left atrium size (LA),
- ii) deriving a test score based on the measured parameters;
- iii) providing a threshold score; and
- iv) comparing the test score with the threshold score, wherein a test score equal to or higher than the threshold score is predictive for the presence of paroxysmal atrial fibrillation.

With this method it is possible to predict whether paroxysmal atrial fibrillation is present in a subject or not. Thus, this method allows to easily and reliably determine if any (medical) treatment should be applied to the patient in order to prevent any (further) stroke.

An advantage coming along with the method according to the present invention is that for the prediction of paroxysmal atrial fibrillation no time-consuming diagnostic procedures or surgical intervention are required. Rather, only by collecting easy obtainable data said prediction can be made.

Hence, by analyzing pathophysiological aspects and echocardiographic parameters in AF a method is provided for classification between sinus rhythm (SR) and pAF. In the clinical practice this method contributes to the early detection of pAF in patients undergoing an echocardiographic investigation and therefore creates an additional diagnostic value of echocardiographic parameters. The indication of a risk for pAF could suggest conducting further electrophysiological investigations to verify the presence of pAF.

As “subject” any human or animal subject is meant. Preferably the subject is a human.

The data required for the method according to the present invention is clinical data which comprises basic physiologic (age and smoker), cardiologic and medical history parameters (heart frequency, sleep apnea, hyperlipidemia, type 2 diabetes mellitus, catheter ablation). Additionally, medication data (intake of beta blocker) and echocardiographic parameters (left ventricular end-diastolic diameter (LV ESD), aortic root diameter, left atrial diameter (LA) and tissue Doppler imaging velocity during atrial contraction (TDI, A') are comprised.

Of these various parameters LA, and age represent the basic set of parameters that are determined in order to make a reliable prediction. The determination of any further parameters is optional, whereby any combination of parameters can be chosen.

The third most significant parameter is TDI, A' and the fourth most significant parameter for a reliable prediction is aortic root diameter. Thus, preferably in addition to LA and age, TDI, A' and/or aortic root diameter should be included.

Preferably, in addition to LA, and age and, optionally to TDI, A', and/or aortic root diameter, it is determined whether the subject has hyperlipidemia and/or type II diabetes mellitus.

These two additional parameters are easily obtainable by routine *in vitro* blood sample testings.

Additionally, as further parameter at least one or any combination of two or more of catheter ablation, left ventricular injection fraction, heart rate, sleep apnea, intake of beta blocker and smoker can be determined. By adding further parameters to the set of parameters to be determined the performance of the method according to the invention can be increased in order to classify between pAF and SR more reliably.

In a preferred embodiment, the method disclosed herein comprises the step of determining at least one of the following sets of parameters:

- A) Tissue Doppler imaging velocity during atrial contraction, left atrium size, age and aortic root diameter;
- B) Tissue Doppler imaging velocity during atrial contracting, left atrium size, age, aortic root diameter and hyperlipidemia;

- C) Tissue Doppler imaging velocity during atrial contracting, left atrium size, age, aortic root diameter and diabetes mellitus;
- D) Tissue Doppler imaging velocity during atrial contracting, left atrium size, age, aortic root diameter, hyperlipidemia and diabetes mellitus; and/or
- 5 E) Tissue Doppler imaging velocity during atrial contracting, left atrium size, age, aortic root diameter, hyperlipidemia, diabetes mellitus, catheter ablation, left ventricular end-diastolic diameter, heart rate, sleep apnea, intake of beta blocker and smoker.

Data concerning physiological or medication parameters can easily be obtained from a subject, for example, by personal interrogation. The same applies to medical history parameters.

10 For a person skilled in the art it is common knowledge how the echocardiographic parameters can be determined. For example, echocardiographic examinations can be performed on commercially available ultrasound systems (Vivid S5, Vivid i, Vivid 7 and Vivid E9 GE Healthcare Vingmed, Trondheim, Norway and ie33, Philips, Eindhoven, the Netherlands) according to the guidelines of the American Society of Echocardiography [10].

15 In a preferred embodiment, the echocardiography images include parasternal, apical and subxiphoidal views using 1.5 to 4.0 MHz phase-array transducers. Preferably, all the examinations are performed with 2D echocardiography for anatomic imaging and Doppler echocardiography for assessment of velocities.

20 Preferably, LA size is determined as the maximal distance between the posterior aortic root wall and the posterior left atrial wall at the end of systole. Aortic root diameter and LV end-systolic diameters (LV, ESD) are preferably obtained in the parasternal long axis view. Tissue Doppler images (TDI) velocities are preferably measured in the apical four chamber view. Preferably, images are digitally stored in a Picture Archiving and Communication System (PACS) and analyzed at clinical workstations.

25 The presence of hyperlipidemia or diabetes can easily be determined by performing *in vitro* assays. In terms of hyperlipidemia the lipids within a blood sample are measured. For testing the presence of type II diabetes mellitus, the glucose concentration within the blood is measured. These assays are standard *in vitro* methods, which are known to a person skilled in the art. In order to perform these assays a blood sample from the patient is required.

30 In terms of the binary parameters “smoker”, “sleep apnea”, “hyperlipidemia”, “type II diabetes mellitus”, “catheter ablation” and “intake of beta blocker” it has to be determined whether the subject to be examined actually does smoke, suffers from sleep apnea, suffers from hyperlipidemia, suffers from type II diabetes mellitus, has had the catheter ablation or takes beta blockers, respectively.

Accordingly, if a property is present in a patient, parameters “smoker”, “sleep apnea” “hyperlipidemia”, “type II diabetes mellitus”, “catheter ablation” or “intake of beta blocker” will have a value of 1, or otherwise will have a value of 0 in absence of the property. Once the desired parameters have been determined, their combination allows deriving a test score based on the measured parameters. Beside the determination of the desired parameters and the derivation of the test score based on the measured parameters a threshold score is provided. The threshold score represents a value allowing to conclude whether the result of the method actually indicates an increased probability for the presence of paroxysmal atrial fibrillation in the examined subject or not. If the derived test score equals or exceeds the provided threshold score, the result can be interpreted as the presence of an increased probability for paroxysmal atrial fibrillation in the examined subject. Given the case that, according to the performed method as disclosed herein, presence of pAF can be assumed, further (electrophysiological) investigations can be conducted to verify the presence of pAF.

Thus, the method disclosed herein allows predicting the presence of pAF by using the data for parameters that are obtained anyway when the subject to be investigated is undergoing an echocardiographic examination. Hence, without any additional effort when performing these routine examinations, a prediction for the presence of pAF can be made, which usually is difficult to diagnose. By this, patients can be identified for which it might be necessary to conduct, for example, a long term observation of the cardiac functions. This, in the end, can lead to the verification of the presence of pAF, allowing an application of the required treatment. Only when being aware of an increased risk for pAF the subject can be treated accordingly, and the risk for suffering from (another) stroke can be decreased or even eliminated.

In order to derive the test score the determined parameters can be combined either in a logistic or in a linear function.

When combining the determined parameters in a logistic function, the formula for obtaining the test score S_r is

6

$$S_r = \frac{1}{\exp \left(\begin{aligned} & -\theta_{0,r} - \theta_{age,r} \cdot \frac{\text{age}}{y} - \theta_{Ao,root,r} \cdot \frac{\text{Ao,root}}{\text{mm}} - \theta_{LA,r} \cdot \frac{\text{LA}}{\text{mm}} \\ & - \theta_{LV,ESD,r} \cdot \frac{\text{LV,ESD}}{\text{mm}} - \theta_{TDL,A',r} \cdot \frac{\text{TDL,A'}}{\text{cm/s}} - \theta_{HF,r} \cdot \frac{\text{HF}}{\text{l/min}} \\ & - \theta_{\text{sleep apnea},r} \cdot \text{sleep apnea} - \theta_{\text{hyperlipidemia},r} \cdot \text{hyperlipidemia} - \theta_{\text{type II diabetes},r} \cdot \text{type II diabetes} \\ & - \theta_{\text{smoker},r} \cdot \text{smoker} - \theta_{\beta \text{ blocker},r} \cdot \beta \text{ blocker} - \theta_{\text{catheter ablation},r} \cdot \text{catheter ablation} \end{aligned} \right) + 1}$$

(Formula I)

with the score variants r, the offsets $\theta_{0,r}$ and the weights

$$\vec{\theta}_r = [\theta_{age,r}; \theta_{Ao,root,r}; \theta_{LA,r}; \theta_{LV,ESD,r}; \theta_{TDL,A',r}; \theta_{HF,r}; \theta_{\text{sleep apnea},r}; \theta_{\text{hyperlipidemia},r}; \theta_{\text{type II diabetes},r}; \theta_{\text{smoker},r}; \theta_{\beta \text{ blocker},r}; \theta_{\text{catheter ablation},r}]$$

and wherein

age is the age of the subject,

10

Ao_{root} is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject,

LV, ESD is left ventricular end-systolic diameter of the subject,

5 TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

hyperlipidemia indicates whether the subject has hyperlipidemia,

type II diabetes indicates whether the subject has type II diabetes,

10 smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

In Formula I and all other formulas disclosed herein the score variant indices *r* represent the parameter subsets to be determined. In said generalized formula for the logistic score, which
15 contains the subsets of variables and offsets, weights are either 0 for not included variables or have values obtained by logistic regression based on a training set of patient data. To obtain weights and offsets, maximum likelihood estimation algorithms can be applied.

The offsets and the weights depend on the amount and the kind of parameters that are supposed to be determined. The corresponding values for the logistic coefficient offsets and the
20 weights for the different parameters depending on the actual set of parameters can be found in table 1.

The formula for obtaining the logistic test score S_2 with the two basic parameters age and LA is

$$S_2 = \frac{1}{\exp\left(8.797 - 0.12329 \cdot \frac{LA}{\text{mm}} - 0.03436 \cdot \frac{\text{age}}{y}\right) + 1}$$

25 (Formula VIII)

wherein

age is the age of the subject, and

LA is the size of the left atrium of the subject.

In Formula I the offset $\theta_{0,r}$ equals -8.797, $\theta_{LA,r}$ equals 0.12329, and $\theta_{age,r}$ equals 0.03436.

30 The indicated offsets and weighting coefficients in Formula I can be varied by a maximum of 10%. Preferably, the offsets and weighting coefficients vary by a maximum of 5%, 4% or 3%. More preferably, the offsets and weighting coefficients vary by a maximum of 2% or, most preferably, they vary by a maximum of 1%.

In the method of the invention the presence of paroxysmal atrial fibrillation is predicted when the logistic test score equals or exceeds a threshold score at a value of about 0.1506.

The formula for obtaining the logistic test score S_4 with the four basic parameters TDI, A', LA, age and aortic root diameter is

$$S_4 = \frac{1}{\exp \left(\begin{aligned} &9.402 - 0.04363 \cdot \frac{\text{age}}{\text{y}} - 0.0802 \cdot \frac{\text{Ao,root}}{\text{mm}} \\ &- 0.08260 \cdot \frac{\text{LA}}{\text{mm}} + 0.1382 \cdot \frac{\text{TDI, A'}}{\text{cm/s}} \end{aligned} \right) + 1}$$

(Formula II)

wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

10 LA is the size of the left atrium of the subject,

TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject.

In Formula II the offset $\theta_{0,r}$ equals -9.402, $\theta_{\text{age},r}$ equals 0.04363, $\theta_{\text{Ao,root},r}$ equals 0.08023, $\theta_{\text{LA},r}$ equals 0.08260 and $\theta_{\text{TDI,A'},r}$ equals -0.1382.

The indicated offsets and weighting coefficients in Formula II can be varied by a maximum of 10%. Preferably, the offsets and weighting coefficients vary by a maximum of 5%, 4% or 3%. More preferably, the offsets and weighting coefficients vary by a maximum of 2% or, most preferably, they vary by a maximum of 1%.

When using Formula II, i.e., a logistic function with the four basic parameters age, aortic root diameter, left atrium size and tissue Doppler imaging velocity during atrial contraction the threshold score provided is about 0.1324. This means presence of paroxysmal atrial fibrillation is predicted when the logistic test score equals or exceeds said threshold score.

The threshold score depends on the parameter set which is determined. This means that depending on the parameters that are actually determined in addition to the basic four parameters the threshold score for the linear model varies. For all models S_r , threshold scores $S_{r,thd}$ were determined from receiver operating characteristic (ROC) curves. ROC curves indicate sensitivity versus false positive rate, equivalent to $1 - \text{specificity}$, and are obtained by applying variable model thresholds on patient datasets. ROC curves were calculated after applying 100-fold crossvalidation of prediction models on a patient dataset. Threshold scores for testing with a sensitivity of 80% based on different parameter combinations can be found in table 1.

To claim an easy implementable decision aid for initializing diagnostic testing for pAF the reduced logistic model can be transformed to a linear model. Also, for the linear model the same principle applies, i.e., in case the derived test score equals or exceeds a provided threshold score, this predicts the presence of pAF is increased and further diagnostic procedures such as Holter ECG can be applied to validate or disprove the presence of pAF.

To derive linear scores the calibrated logistic model with two, three, four, five, six, seven, eight, nine, ten, eleven or twelve parameters can be transformed to linear scores. Logarithmic scores S_r can be transformed to linear scores J_r for the same subset of variables. Accordingly, linear scores read

$$\begin{aligned}
 J_r = & \theta_{0,r} + \theta_{age,r} \cdot \frac{\text{age}}{y} + \theta_{Ao,root,r} \cdot \frac{\text{Ao,root}}{\text{mm}} + \theta_{LA,r} \cdot \frac{\text{LA}}{\text{mm}} + \theta_{LV,ESD,r} \cdot \frac{\text{LV,ESD}}{\text{mm}} + \theta_{TDL,A',r} \cdot \frac{\text{TDL,A'}}{\text{cm/s}} \\
 & + \theta_{HF,r} \cdot \frac{\text{HF}}{1/\text{min}} + \theta_{\text{sleep apnea},r} \cdot \text{sleep apnea} + \theta_{\text{hyperlipidemia},r} \cdot \text{hyperlipidemia} + \theta_{\text{type II diabetes},r} \cdot \text{type II diabetes} \\
 & + \theta_{\text{smoker},r} \cdot \text{smoker} + \theta_{\beta \text{ blocker},r} \cdot \beta \text{ blocker} + \theta_{\text{catheter ablation},r} \cdot \text{catheter ablation}
 \end{aligned}$$

(Formula III).

To simplify using linear scores, they can be transformed to a standardized interval by subtracting the 1% percentile value of J_r , $p_1(J_r)$, multiplying by 100, and dividing by the difference between the 99% percentile and the 1% percentiles, $p_{99}(J_r) - p_1(J_r)$, which results in

$$L_r = \frac{100}{p_{99}(J_r) - p_1(J_r)} (J_r - p_1(J_r)).$$

(Formula IV)

A person skilled in the art would know that the coefficients of the linear scores are redundant once knowing the values of the logistic coefficient scores. Therefore, Table 1 contains only the coefficients of logarithmic model scores, values for $p_1(J_r)$, and differences $p_{99}(J_r) - p_1(J_r)$. Accordingly, linear score weights are obtained by inserting Formula III in Formula IV, which results in

$$L_r = \phi_{0,r} + \phi_{age,r} \cdot \frac{\text{age}}{y} + \phi_{Ao,root,r} \cdot \frac{\text{Ao, root}}{\text{mm}} + \phi_{LA,r} \cdot \frac{\text{LA}}{\text{mm}} + \phi_{LV,ESD,r} \cdot \frac{\text{LV, ESD}}{\text{mm}} + \phi_{TDL,A',r} \cdot \frac{\text{TDL, A'}}{\text{cm/s}} + \phi_{HF,r} \cdot \frac{\text{HF}}{1/\text{min}}$$

$$+ \phi_{\text{sleep apnea},r} \cdot \text{sleep apnea} + \phi_{\text{hyperlipidemia},r} \cdot \text{hyperlipidemia} + \phi_{\text{type II diabetes},r} \cdot \text{type II diabetes}$$

$$+ \phi_{\text{smoker},r} \cdot \text{smoker} + \phi_{\beta \text{ blocker},r} \cdot \beta \text{ blocker} + \phi_{\text{catheter ablation},r} \cdot \text{catheter ablation}$$

5

(Formula V)

with offsets $\phi_{0,r}$ and weights

$$\vec{\phi}_r = \{ \phi_{age,r}; \phi_{Ao,root,r}; \phi_{LA,r}; \phi_{LV,ESD,r}; \phi_{TDL,A',r}; \phi_{HF,r}; \phi_{\text{sleep apnea},r}; \phi_{\text{hyperlipidemia},r}; \phi_{\text{type II diabetes},r}; \phi_{\text{smoker},r}; \phi_{\beta \text{ blocker},r}; \phi_{\text{catheter ablation},r} \} ,$$

wherein

10

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject,

5 LV, ESD is left ventricular end-systolic diameter of the subject,

TDI,A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

hyperlipidemia indicates whether the subject has hyperlipidemia,

10 type II diabetes indicates whether the subject has type II diabetes,

smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

To predict presence of pAF based on linear scores, as for logarithmic scores, score values
15 have to equal or exceed certain threshold values $L_{r,thd}$. These threshold values for linear scores are obtained, according to Formulas I to IV, by inserting threshold scores for logarithmic model scores $S_{r,thd}$ into

$$L_{r,thd} = \frac{100}{p_{99}(J_r) - p_1(J_r)} \left[\log \left(\frac{S_{r,thd}}{S_{r,thd} - 1} \right) - p_1(J_r) \right].$$

(Formula VI)

20 When transforming S_2 (Formula VIII), according to Formulas III to V, to a linear function in order to obtain the linear test score L_2 it reads

$$L_2 = -95.19 + 2.587 \cdot \frac{LA}{mm} + 0.7211 \cdot \frac{age}{y}$$

wherein

age is the age of the subject,

25 LA is the size of the left atrium of the subject.

The indicated offsets and weighting coefficients in Formula VII can be varied by a maximum of 10%. Preferably, the offsets and weighting coefficients vary by a maximum of 5%, 4% or 3%. More preferably, the offsets and weighting coefficients vary by a maximum of 2% or, most preferably, they vary by a maximum of 1%.

30 In the method of the invention the presence of paroxysmal atrial fibrillation is predicted when the linear test score equals or exceeds a threshold score at a value of about 53.10.

When transforming S_4 (Formula II), according to Formulas III to V, to a linear function in order to obtain the linear test score L_4 it reads

$$L_4 = -95.89 + 0.8746 \cdot \frac{age}{y} + 1.608 \cdot \frac{Ao, root}{mm} + 1.656 \cdot \frac{LA}{mm} - 2.770 \cdot \frac{TDI, A'}{cm/s}$$

(Formula VII)

5 wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject, and

TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject.

10 The indicated offsets and weighting coefficients in Formula VII can be varied by a maximum of 10%. Preferably, the offsets and weighting coefficients vary by a maximum of 5%, 4% or 3%. More preferably, the offsets and weighting coefficients vary by a maximum of 2% or, most preferably, they vary by a maximum of 1%.

When using Formula VII, i.e. a linear function with the four basic parameters age, aortic root diameter, left atrium size and tissue Doppler imaging velocity during atrial contraction the threshold score derived by applying Formula VI on the threshold for S_4 , again for testing with 80% sensitivity, is about 54.88. This means presence of paroxysmal atrial fibrillation is predicted when the linear test score equals or exceeds said threshold score.

15 The threshold score depends on the parameter set which is determined. This means that depending on the parameters that are actually determined in addition to the basic four parameters the threshold score for the linear model varies. For testing with 80% sensitivity, threshold scores $L_{r,thd}$ for the different parameter combinations in linear scores L_r can be obtained by inserting logarithmic model thresholds $S_{r,thd}$ from Table 1 in Formula VI.

25 By the method according to the present invention, presence of paroxysmal atrial fibrillation in a subject to be examined can be predicted by using either a logistic or a linear function model.

According to a further aspect of the present invention, a system is provided for predicting paroxysmal atrial fibrillation comprising

- i) an ultrasound apparatus for determining at least the parameters tissue Doppler imaging velocity during atrial contraction, left atrium size, and aortic root diameter,
- 30 ii) an input device,
- iii) an analyzing device, and
- iv) an output device,

wherein the analyzing device is embodied for analyzing the information provided by the ultrasound apparatus and the input device, and the output device is embodied for outputting the result derived from the analysis by indicating whether an increased probability for paroxysmal atrial fibrillation is present.

5 Thus, the present invention provides a system that can easily be incorporated within clinical routine examinations. The components required are usually present in clinics anyway and therefore it merely requires the integration of the desired algorithms within the analyzing device to obtain the scores as disclosed herein. This simple integration, however, brings along the highly useful support in making the decision whether additional treatments like, for example, Holter
10 ECG, should be applied to a subject or not. Due to the ability of the system to predict an increased probability for pAF patients can be identified that might suffer from pAF, which usually stays unobserved.

For the system according to the present invention no special instruments or devices are required. Rather, the system works with devices present in clinics anyway.

15 Additionally, the system does not require any specific examination of a subject but works with data obtained by routine examinations. By automatically calculating the required scores and presenting the final result the doctor in charge can be provided with this information during performing the routine examination with the difference that when a decision has to be made whether the subject needs further treatment, support is provided by the system as disclosed herein.

20 The system according to the invention will now be explained by way of an example with reference to the attached drawing in which Figure 1 is a schematic depiction of a system for predicting the presence of pAF.

An ultrasound apparatus 1 is used to obtain echocardiography data by examining the subject to be investigated. These data are transferred to an analyzing device 3. The analyzing device
25 3 is embodied for analyzing the information provided by the ultrasound apparatus and the input device 2. The input device 2 is used for entering additional data for parameters to be determined. Such data can, for example, be the age of the subject to be investigated or whether the subject is a smoker or suffers of hyperlipidemia or diabetes mellitus. Further data that can be entered via the input device are data relating to the medication like the intake of beta blockers etc. As input
30 device any kind of computer like a computer, laptop, a tablet or a cellphone can be used. The analyzing device 3 can, for example, be any kind of computer suitable for carrying out the required analysis. The data can then be transferred from the analyzing device to an output device 4 which allows the presentation of the obtained result in any suitable way. The information provid-

ed by the output device should in some way provide the information whether the examined subject has an increased probability for the presence of pAF or not.

The connection between the different components can be via wire or can be wireless. How the data can be transferred between the different components is known to a person skilled in the art.

The ultrasound apparatus can be any device known by persons skilled in the art suitable for determining echocardiographic parameters in particular tissue Doppler imaging velocity during atrial contraction, left atrium size and aortic root diameter. Examples of such commercially available ultrasound systems are Vivid S5, Vivid i, Vivid 7 and Vivid E9 GE Healthcare Vingmed, Trondheim, Norway and ie33, Philips, Eindhoven, the Netherlands.

The input device can be any device known to a person skilled in the art suitable for entering or feeding data into the system. Examples for such input devices are any kind of keyboards optionally integrated within a tablet, a laptop or a cellphone. The input device can further comprise a storing device for storing the entered data. Such a combined device could be a computer.

The analyzing device can be any kind of device known to a person skilled in the art suitable for analyzing the entered data in order to derive the desired scores like test scores, threshold scores, offsets, weight coefficients etc. Furthermore, such an analyzing device should be able to combine the obtained data in a way that the test scores are obtained by the Formulas for a logistic (Formula I) or linear model (Formula V), as described above. The analyzing device should be embodied for evaluating the information provided by the ultrasound apparatus and the input device. Thus, the information obtained with either the ultrasound apparatus or the input device come together within the analyzing device in order to obtain the test score, which derives from the data obtained by both the ultrasound apparatus and the input device.

The output device is any kind of device suitable for displaying the result derived from the analysis of the analyzing device. Thereby the output device should be embodied in order to indicate whether an increased probability for pAF is present or not. Output devices are any kind of displays like, for example, on a computer, on a tablet or on a cellphone or on any kind of screen.

The different components of the system can be connected in any way embodied for transferring the data to be transferred as known to a person skilled in the art. I.e. the components can be connected via wire or wireless or obtain the data from any storage system that can be used for these devices.

In a preferred embodiment the system disclosed herein is embodied to perform the method for predicting pAF as disclosed herein.

Examples

1. Logistic models

A) Logistic model for the basic set of two parameters

The following is the logistic model equation for the method according to the present invention comprising the determination of the two basic parameters left atrium size and age. In order to derive the test score S_2 based on the measurement of these parameters S_2 is

$$S_2 = \frac{1}{\exp\left(8.797 - 0.12329 \cdot \frac{\text{LA}}{\text{mm}} - 0.03436 \cdot \frac{\text{age}}{\text{y}}\right) + 1}$$

wherein

LA is the size of the left atrium of the subject, and

age is the age of the subject.

In this Formula the weights for the parameters LA and age are 0.12329 and 0.03436, respectively. Since the other parameters are not included within this set their values can be considered as being 0. The offset is $\theta_0 = -8.797$.

In this case at 80% sensitivity a threshold score of $S_2 \geq 0.1506$ has to be attained for classification as pAF.

B) Logistic model for a set of four parameters

The following is the logistic model equation for the method according to the present invention comprising the determination of the four parameters tissue Doppler imaging velocity to an atrial contraction, left atrium size, age and aortic root diameter. In order to derive the test score S_4 based on the measurement of these parameters S_4 is

$$S_4 = \frac{1}{\exp\left(9.402 + 0.1382 \cdot \frac{\text{TDI, A'}}{\text{cm/s}} - 0.08260 \cdot \frac{\text{LA}}{\text{mm}} - 0.04363 \cdot \frac{\text{age}}{\text{y}} - 0.0802 \cdot \frac{\text{Ao, root}}{\text{mm}}\right) + 1}$$

wherein

TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

LA is the size of the left atrium of the subject,

age is the age of the subject, and

Ao, root is the diameter of the aortic root of the subject.

In this Formula the weights for the parameters TDI,A', LA, age and Ao,root are -0.1382, 0.08260, 0.04363 and 0.0802, respectively. Since the other parameters are not included within this set their values can be considered as being 0. The offset is $\theta_0 = -9.402$.

In this case at 80% sensitivity a threshold score of $S_4 \geq 0.1324$ has to be attained for classification as pAF.

C) Logistic model for the set with all twelve parameters

The following is the formula for the method according to the present invention comprising the determination of all twelve parameters. In order to derive the test score S_{12} based on the measurement of these parameters S_{12} is

$$S_{12} = \frac{1}{\exp \left(\begin{aligned} &10.63 - 0.03922 \cdot \frac{\text{age}}{\text{y}} - 0.1016 \cdot \frac{\text{Ao,root}}{\text{mm}} - 0.08772 \cdot \frac{\text{LA}}{\text{mm}} \\ &+ 0.03890 \cdot \frac{\text{LV,ESD}}{\text{mm}} + 0.1834 \cdot \frac{\text{TDI,A'}}{\text{cm/s}} - 0.01783 \cdot \frac{\text{HF}}{\text{1/min}} \\ &- 1.282 \cdot \text{sleep apnea} - 0.4872 \cdot \text{hyperlipidemia} + 0.02329 \cdot \text{type II diabetes} \\ &- 0.08833 \cdot \text{smoker} - 0.6197 \cdot \beta \text{ blocker} - 2.498 \cdot \text{catheter ablation} \end{aligned} \right) + 1}$$

wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject,

LV, ESD is left ventricular end-systolic diameter of the subject,

TDI,A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

hyperlipidemia indicates whether the subject has hyperlipidemia,

type II diabetes indicates whether the subject has type II diabetes,

smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

In this case at 80% sensitivity a threshold score of $S_{12} \geq 0.1384$ has to be attained for classification as pAF.

2. Linear models

A) Linear model for the basic set of four parameters

The following is the linear formula for the method according to the present invention comprising the determination of the two basic parameters left atrium size and age. In order to derive the test score L_2 based on the measurement of these parameters L_2 is

$$L_4 = -95.19 + 2.587 \cdot \frac{LA}{mm} + 0.7211 \cdot \frac{age}{y}$$

wherein

TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

LA is the size of the left atrium of the subject,

age is the age of the subject, and

Ao,root is the diameter of the aortic root of the subject.

In this Formula the weights for the parameters LA and age are 2.587 and 0.7211, respectively. Since the other parameters are not included within this set their values can be considered as being 0. The offset is $\phi_0 = -95.19$.

In this case at 80% sensitivity a threshold score of $L_4 \geq 53.10$ has to be attained for classification as pAF.

B) Linear model for a set of four parameters

The following is the linear formula for the method according to the present invention comprising the determination of the four parameters tissue Doppler imaging velocity to an atrial contraction, left atrium size, age and aortic root diameter. In order to derive the test score L_4 based on the measurement of these parameters L_4 is

$$L_4 = -95.89 - 2.700 \cdot \frac{TDI, A'}{cm/s} + 1.656 \cdot \frac{LA}{mm} + 0.8746 \cdot \frac{age}{y} + 1.608 \cdot \frac{Ao, root}{mm}$$

wherein

TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

LA is the size of the left atrium of the subject,

age is the age of the subject, and

Ao,root is the diameter of the aortic root of the subject.

In this Formula the weights for the parameters TDI, A', LA, age and Ao,root are -2.770, 1.656, 0.8746 and 1.608, respectively. Since the other parameters are not included within this set their values can be considered as being 0. The offset is $\phi_0 = -95.89$.

5 In this case at 80% sensitivity a threshold score of $L_4 \geq 54.88$ has to be attained for classification as pAF.

10 C) Linear model for the basic set of all twelve parameters

The following is the formula for the method according to the present invention comprising the determination of all twelve parameters. In order to derive the test score L_{12} based on the measurement of these parameters L_{12} is

$$\begin{aligned} L_{12} = & -79.26 + 0.6135 \cdot \frac{age}{y} + 1.589 \cdot \frac{Ao,root}{mm} + 1.371 \cdot \frac{LA}{mm} \\ & - 0.6084 \cdot \frac{LV,ESD}{mm} - 2.868 \cdot \frac{TDI,A'}{cm/s} + 0.2789 \cdot \frac{HF}{l/min} \\ & + 20.04 \cdot sleep\ apnea + 7.620 \cdot hyperlipidemia - 0.3643 \cdot type\ II\ diabetes \\ & + 1.381 \cdot smoker + 9.692 \cdot \beta\ blocker + 39.06 \cdot catheter\ ablation \end{aligned}$$

15 wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject,

LV, ESD is left ventricular end-systolic diameter of the subject,

20 TDI,A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

hyperlipidemia indicates whether the subject has hyperlipidemia,

type II diabetes indicates whether the subject has type II diabetes,

25 smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

30 In this case at 80% sensitivity a threshold score of $L_{12} \geq 58.33$ has to be attained for classification as pAF.

References

1. Schmidt C, Kisselbach J, Schweizer PA, Katus HA, Thomas D. The pathology and treatment of cardiac arrhythmias: focus on atrial fibrillation. *Vasc Health Risk Manag.* 2011;7: 193–202. doi:10.2147/VHRM.S10758
2. Christensen LM, Krieger DW, Højberg S, Pedersen OD, Karlsen FM, Jacobsen MD, et al. Paroxysmal atrial fibrillation occurs often in cryptogenic ischaemic stroke. Final results from the SURPRISE study. *Eur J Neurol.* 2014;21: 884–889. doi:10.1111/ene.12400
3. Wohlfahrt J, Stahrenberg R, Weber-Krüger M, Gröschel S, Wasser K, Edelmann F, et al. Clinical predictors to identify paroxysmal atrial fibrillation after ischaemic stroke. *Eur J Neurol.* 2014;21: 21–27. doi:10.1111/ene.12198
4. Kirchhof P, Breithardt G, Bax J, Benninger G, Blomstrom-Lundqvist C, Boriani G, et al. A roadmap to improve the quality of atrial fibrillation management: proceedings from the fifth Atrial Fibrillation Network/European Heart Rhythm Association consensus conference. *Europace.* 2015; doi:10.1093/europace/euv304
5. Nattel S, Andrade J, Macle L, Rivard L, Dyrda K, Mondesert B, et al. New directions in cardiac arrhythmia management: present challenges and future solutions. *Can J Cardiol.* 2014;30: S420–430. doi:10.1016/j.cjca.2014.09.027
6. European Heart Rhythm Association, European Association for Cardio-Thoracic Surgery, Camm AJ, Kirchhof P, Lip GYH, Schotten U, et al. Guidelines for the management of atrial fibrillation: the Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). *Eur Heart J.* 2010;31: 2369–2429. doi:10.1093/eurheartj/ehq278
7. Vaziri SM, Larson MG, Benjamin EJ, Levy D. Echocardiographic predictors of nonrheumatic atrial fibrillation. The Framingham Heart Study. *Circulation.* 1994;89: 724–730.
8. Rosenberg MA, Gottdiener JS, Heckbert SR, Mukamal KJ. Echocardiographic diastolic parameters and risk of atrial fibrillation: the Cardiovascular Health Study. *Eur Heart J.* 2012;33: 904–912. doi:10.1093/eurheartj/ehr378
9. The Stroke Prevention in Atrial Fibrillation Investigators. Predictors of Thromboembolism in Atrial Fibrillation: II. Echocardiographic Features of Patients at Risk. *Ann Intern Med.* 1992;116: 6–12. doi:10.7326/0003-4819-116-1-6

10. Lang RM, Bierig M, Devereux RB, Flachskampf FA, Foster E, Pellikka PA, et al. Recommendations for chamber quantification: a report from the American Society of Echocardiography's Guidelines and Standards Committee and the Chamber Quantification Writing Group, developed in conjunction with the European Association of Echocardiography, a branch of the European Society of Cardiology. *J Am Soc Echocardiogr.* 2005;18:1440–1463. doi:10.1016/j.echo.2005.10.005
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Table 1. Coefficients, threshold values and scaling coefficients for logarithmic models S_r .

in- dex- for S_r	coefficients of logistic model variants θ													thresh- olds $S_{r,hd}$	coefficients for rescaling to linear score		
	r	offset	age	Ao,root	LA	LV,ESD	sleep apnea	hyperli- pidemia	type II diabetes	smoker	β blocker	catheter ablation	DTI,A'	HF		thresh- olds at 80% sensitivi- ty	$p_{99}(J_r)$ - $p_1(J_r)$
1		-10.626	0.03922	0.10159	0.08772	-0.0390	1.282	0.4872	-0.0233	0.0883	0.6197	2.498	-0.1834	0.01783	0.1384	6.394	-5.558
2		-9.067	0.03806	0.09327	0.09142	-0.03743	1.225	0.3836	0.0282	0.1039	0.5831	2.375	-0.1846	0	0.1389	6.154	-5.358
3		-12.366	0.03214	0.07657	0.11223	-0.02668	0.992	0.3035	0.0431	0.1730	0.7837	1.985	0	0.02158	0.1483	6.038	-5.145
4		-10.427	0.03019	0.06510	0.11706	-0.02438	0.898	0.1719	0.0986	0.1891	0.7416	1.848	0	0	0.1484	5.598	-4.894
5		-10.458	0.03819	0.10057	0.08651	-0.03852	1.227	0.4647	-0.0628	0.0786	0.6617	0	-0.1725	0.01691	0.1327	6.203	-5.422
6		-9.009	0.03748	0.09321	0.08981	-0.03682	1.178	0.3675	-0.0151	0.0922	0.6219	0	-0.1757	0	0.1393	5.777	-5.197
7		-12.190	0.03118	0.07672	0.11129	-0.02735	0.958	0.3039	0.0082	0.1641	0.8161	0	0	0.02111	0.1547	5.875	-5.064
8		-10.310	0.02944	0.06556	0.11591	-0.02477	0.869	0.1744	0.0630	0.1788	0.7704	0	0	0	0.1515	5.479	-4.826
9		-10.550	0.04176	0.09799	0.09438	-0.03605	1.390	0.5971	-0.0484	0.1096	0	2.592	-0.1895	0.01724	0.1343	6.155	-5.330
10		-9.052	0.04065	0.09012	0.09752	-0.03492	1.330	0.4918	0.0057	0.1242	0	2.456	-0.1901	0	0.1344	5.967	-5.268
11		-12.300	0.03517	0.06998	0.12207	-0.02304	1.137	0.4200	0.0249	0.1991	0	2.093	0	0.02077	0.1291	5.880	-4.972
12		-10.455	0.03335	0.05969	0.12616	-0.02120	1.041	0.2914	0.0825	0.2125	0	1.943	0	0	0.1351	5.484	-4.786
13		-10.362	0.04090	0.09697	0.09329	-0.03537	1.342	0.5796	-0.0892	0.1014	0	0	-0.1794	0.01618	0.1361	5.884	-5.173
14		-8.987	0.04022	0.09009	0.09604	-0.03405	1.290	0.4808	-0.0391	0.1137	0	0	-0.1817	0	0.1397	5.689	-5.150
15		-12.103	0.03421	0.07005	0.12131	-0.02350	1.106	0.4245	-0.0118	0.1906	0	0	0	0.02020	0.1275	5.562	-4.875
16		-10.329	0.03265	0.06011	0.12512	-0.02140	1.015	0.2974	0.0452	0.2025	0	0	0	0	0.1338	5.234	-4.705
17		-10.603	0.03865	0.09675	0.09122	-0.03691	1.219	0.5096	0.0182	0	0.6383	2.439	-0.1694	0.01629	0.1371	6.330	-5.489
18		-9.162	0.03753	0.08928	0.09404	-0.03508	1.176	0.4167	0.0482	0	0.6026	2.334	-0.1715	0	0.1457	6.000	-5.235
19		-12.189	0.03074	0.07222	0.11567	-0.02479	0.936	0.3440	0.0757	0	0.8002	1.954	0	0.02025	0.1511	5.917	-5.013
20		-10.353	0.02886	0.06184	0.11916	-0.02184	0.865	0.2195	0.1062	0	0.7568	1.821	0	0	0.1511	5.543	-4.791
21		-10.447	0.03768	0.09579	0.09020	-0.03672	1.170	0.4886	-0.0228	0	0.6781	0	-0.1596	0.01545	0.1361	6.150	-5.382
22		-9.106	0.03697	0.08913	0.09274	-0.03473	1.134	0.4011	0.0050	0	0.6394	0	-0.1632	0	0.1441	5.749	-5.158
23		-12.022	0.02987	0.07228	0.11487	-0.02557	0.905	0.3430	0.0410	0	0.8305	0	0	0.01979	0.1396	5.700	-4.961

24	-10.244	0.02818	0.06219	0.11824	-0.02243	0.837	0.2210	0.0712	0	0.7839	0	0	0	0.1561	5.383	-4.743
25	-10.510	0.04111	0.09332	0.09791	-0.03383	1.325	0.6211	0.0011	0	2.536	-0.1756	0.01563	0.1355	6.056	-5.263	
26	-9.137	0.04005	0.08639	0.10021	-0.03235	1.280	0.5265	0.0342	0	2.418	-0.1770	0	0.1359	5.956	-5.253	
27	-12.113	0.03368	0.06606	0.12543	-0.02073	1.075	0.4607	0.0664	0	2.063	0	0.01938	0.1396	5.637	-4.826	
28	-10.380	0.03194	0.05690	0.12823	-0.01831	1.004	0.3388	0.0995	0	1.918	0	0	0.1403	5.419	-4.722	
29	-10.334	0.04029	0.09233	0.09702	-0.03335	1.281	0.6043	-0.0405	0	0	-0.1664	0.01466	0.1361	5.809	-5.127	
30	-9.073	0.03962	0.08624	0.09903	-0.03175	1.243	0.5153	-0.0099	0	0	-0.1692	0	0.1362	5.652	-5.127	
31	-11.925	0.03280	0.06600	0.12483	-0.02133	1.047	0.4632	0.0303	0	0	0	0.01882	0.1345	5.450	-4.737	
32	-10.262	0.03129	0.05718	0.12746	-0.01873	0.980	0.3434	0.0632	0	0	0	0	0.1435	5.219	-4.653	
33	-10.217	0.03661	0.09976	0.08363	-0.03775	1.237	0.4441	0	0.0737	0.6589	2.437	-0.1789	0.01701	0.1407	6.198	-5.414
34	-8.763	0.03572	0.09189	0.08751	-0.03607	1.195	0.3555	0	0.0889	0.6222	2.317	-0.1804	0	0.1420	5.988	-5.236
35	-12.018	0.03032	0.07531	0.10866	-0.02563	0.973	0.2840	0	0.1599	0.8126	1.935	0	0.02088	0.1551	5.820	-4.994
36	-10.183	0.02872	0.06420	0.11384	-0.02320	0.897	0.1669	0	0.1768	0.7713	1.796	0	0	0.1480	5.418	-4.759
37	-10.045	0.03554	0.09889	0.08232	-0.03760	1.176	0.4161	0	0.0640	0.7011	0	-0.1684	0.01608	0.1337	6.006	-5.274
38	-8.694	0.03503	0.09195	0.08578	-0.03573	1.141	0.3329	0	0.0775	0.6613	0	-0.1717	0	0.1417	5.609	-5.083
39	-11.835	0.02930	0.07554	0.10758	-0.02642	0.933	0.2783	0	0.1509	0.8448	0	0	0.02038	0.1525	5.692	-4.939
40	-10.058	0.02789	0.06474	0.11253	-0.02374	0.860	0.1634	0	0.1666	0.7999	0	0	0	0.1529	5.330	-4.717
41	-10.118	0.03920	0.09592	0.09051	-0.03480	1.345	0.5564	0	0.0960	0	2.540	-0.1854	0.01635	0.1373	5.911	-5.132
42	-8.733	0.03839	0.08858	0.09382	-0.03347	1.302	0.4668	0	0.1102	0	2.406	-0.1863	0	0.1395	5.726	-5.101
43	-11.940	0.03338	0.06858	0.11867	-0.02189	1.118	0.4020	0	0.1865	0	2.049	0	0.02004	0.1315	5.658	-4.812
44	-10.202	0.03192	0.05868	0.12309	-0.01991	1.041	0.2883	0	0.2005	0	1.897	0	0	0.1388	5.303	-4.659
45	-9.924	0.03830	0.09503	0.08929	-0.03434	1.290	0.5331	0	0.0879	0	0	-0.1755	0.01528	0.1395	5.631	-4.981
46	-8.655	0.03785	0.08864	0.09218	-0.03286	1.253	0.4491	0	0.0999	0	0	-0.1780	0	0.1402	5.510	-4.995
47	-11.733	0.03236	0.06872	0.11773	-0.02247	1.080	0.4001	0	0.1779	0	0	0	0.01944	0.1320	5.355	-4.718
48	-10.067	0.03113	0.05917	0.12188	-0.02026	1.007	0.2881	0	0.1905	0	0	0	0	0.1387	5.065	-4.577
49	-10.231	0.03633	0.09488	0.08755	-0.03575	1.187	0.4753	0	0	0.6729	2.375	-0.1654	0.01552	0.1396	6.097	-5.335
50	-8.882	0.03541	0.08784	0.09053	-0.03387	1.153	0.3932	0	0	0.6387	2.274	-0.1675	0	0.1451	5.857	-5.116
51	-11.874	0.02918	0.07095	0.11256	-0.02384	0.926	0.3312	0	0	0.8269	1.900	0	0.01956	0.1451	5.734	-4.902
52	-10.133	0.02756	0.06097	0.11633	-0.02091	0.865	0.2173	0	0	0.7858	1.768	0	0	0.1524	5.410	-4.699
53	-10.066	0.03529	0.09403	0.08638	-0.03579	1.131	0.4484	0	0	0.7126	0	-0.1558	0.01470	0.1368	5.941	-5.232
54	-8.811	0.03473	0.08776	0.08903	-0.03377	1.103	0.3710	0	0	0.6754	0	-0.1594	0	0.1466	5.562	-5.018

55	-11.698	0.02825	0.07106	0.11157	-0.02473	0.889	0.3240	0	0	0.8566	0	0	0.01910	0.1436	5.556	-4.854
56	-10.013	0.02679	0.06136	0.11521	-0.02163	0.831	0.2127	0	0	0.8124	0	0	0	0.1579	5.252	-4.655
57	-10.121	0.03886	0.09127	0.09445	-0.03257	1.294	0.5899	0	0	0	2.479	-0.1719	0.01484	0.1395	5.866	-5.102
58	-8.845	0.03802	0.08479	0.09691	-0.03102	1.259	0.5071	0	0	0	2.364	-0.1734	0	0.1372	5.723	-5.084
59	-11.792	0.03217	0.06466	0.12251	-0.01966	1.068	0.4507	0	0	0	2.013	0	0.01869	0.1443	5.416	-4.682
60	-10.154	0.03071	0.05590	0.12560	-0.01723	1.007	0.3401	0	0	0	1.870	0	0	0.1462	5.259	-4.593
61	-9.935	0.03797	0.09038	0.09338	-0.03231	1.244	0.5669	0	0	0	0	-0.1630	0.01387	0.1370	5.609	-4.977
62	-8.765	0.03747	0.08470	0.09551	-0.03066	1.214	0.4890	0	0	0	0	-0.1657	0	0.1387	5.461	-4.979
63	-11.593	0.03123	0.06465	0.12169	-0.02037	1.032	0.4468	0	0	0	0	0	0.01812	0.1362	5.288	-4.596
64	-10.024	0.02997	0.05622	0.12461	-0.01778	0.976	0.3383	0	0	0	0	0	0	0.1466	5.026	-4.525
65	-10.475	0.04043	0.09859	0.08828	-0.03685	1.218	0	0.0902	0.0941	0.7412	2.430	-0.1723	0.01610	0.1266	6.375	-5.369
66	-9.079	0.03915	0.09214	0.09130	-0.03590	1.175	0	0.1154	0.1053	0.6862	2.331	-0.1759	0	0.1316	6.021	-5.106
67	-12.228	0.03329	0.07579	0.11203	-0.02587	0.953	0	0.1124	0.1745	0.8477	1.967	0	0.02037	0.1425	5.912	-5.053
68	-10.416	0.03092	0.06534	0.11664	-0.02399	0.876	0	0.1374	0.1886	0.7823	1.846	0	0	0.1406	5.604	-4.828
69	-10.325	0.03952	0.09799	0.08695	-0.03651	1.169	0	0.0450	0.0828	0.7758	0	-0.1631	0.01527	0.1292	6.136	-5.269
70	-9.023	0.03859	0.09226	0.08966	-0.03532	1.132	0	0.0684	0.0929	0.7191	0	-0.1680	0	0.1376	5.620	-5.021
71	-12.055	0.03236	0.07600	0.11106	-0.02650	0.919	0	0.0771	0.1649	0.8797	0	0	0.01990	0.1469	5.776	-4.990
72	-10.299	0.03019	0.06582	0.11545	-0.02436	0.847	0	0.1022	0.1781	0.8113	0	0	0	0.1465	5.429	-4.754
73	-10.375	0.04399	0.09312	0.09734	-0.03256	1.336	0	0.0929	0.1238	0	2.520	-0.1766	0.01493	0.1286	6.032	-5.051
74	-9.089	0.04277	0.08770	0.09928	-0.03209	1.289	0	0.1187	0.1321	0	2.407	-0.1795	0	0.1219	5.839	-5.051
75	-12.122	0.03719	0.06798	0.12335	-0.02138	1.097	0	0.1224	0.2049	0	2.078	0	0.01905	0.1372	5.656	-4.832
76	-10.447	0.03494	0.05943	0.12654	-0.02012	1.016	0	0.1492	0.2141	0	1.947	0	0	0.1398	5.443	-4.719
77	-10.205	0.04328	0.09265	0.09599	-0.03190	1.292	0	0.0473	0.1135	0	0	-0.1683	0.01394	0.1223	5.661	-4.931
78	-9.026	0.04238	0.08792	0.09767	-0.03125	1.250	0	0.0712	0.1203	0	0	-0.1722	0	0.1260	5.482	-4.940
79	-11.927	0.03631	0.06813	0.12251	-0.02174	1.066	0	0.0860	0.1953	0	0	0	0.01844	0.1373	5.531	-4.737
80	-10.322	0.03430	0.05988	0.12544	-0.02026	0.989	0	0.1129	0.2038	0	0	0	0	0.1401	5.276	-4.637
81	-10.442	0.04005	0.09363	0.09163	-0.03464	1.155	0	0.1317	0	0.7632	2.372	-0.1588	0.01449	0.1264	6.269	-5.282
82	-9.171	0.03885	0.08793	0.09389	-0.03337	1.124	0	0.1400	0	0.7122	2.287	-0.1627	0	0.1374	5.980	-5.086
83	-12.033	0.03216	0.07120	0.11542	-0.02384	0.894	0	0.1516	0	0.8712	1.932	0	0.01888	0.1546	5.929	-5.009
84	-10.340	0.02989	0.06197	0.11870	-0.02138	0.838	0	0.1549	0	0.8075	1.818	0	0	0.1477	5.547	-4.727
85	-10.303	0.03919	0.09306	0.09051	-0.03448	1.111	0	0.0856	0	0.7958	0	-0.1504	0.01374	0.1284	5.999	-5.188

86	-9.118	0.03831	0.08796	0.09254	-0.03305	1.085	0	0.0933	0	0.7432	0	-0.1554	0	0.1433	5.658	-5.031
87	-11.871	0.03132	0.07133	0.11460	-0.02459	0.863	0	0.1160	0	0.9006	0	0	0.01843	0.1577	5.764	-4.948
88	-10.232	0.02923	0.06233	0.11775	-0.02194	0.810	0	0.1200	0	0.8344	0	0	0	0.1538	5.418	-4.687
89	-10.322	0.04357	0.08834	0.10075	-0.03002	1.271	0	0.1442	0	0	2.463	-0.1633	0.01325	0.1265	5.944	-4.977
90	-9.172	0.04245	0.08371	0.10203	-0.02926	1.236	0	0.1540	0	0	2.366	-0.1664	0	0.1245	5.761	-4.925
91	-11.918	0.03606	0.06370	0.12678	-0.01887	1.034	0	0.1712	0	0	2.044	0	0.01747	0.1471	5.546	-4.681
92	-10.375	0.03394	0.05635	0.12881	-0.01711	0.975	0	0.1770	0	0	1.921	0	0	0.1478	5.418	-4.614
93	-10.163	0.04290	0.08787	0.09962	-0.02957	1.231	0	0.0981	0	0	0	-0.1558	0.01233	0.1274	5.663	-4.874
94	-9.111	0.04207	0.08382	0.10072	-0.02870	1.201	0	0.1071	0	0	0	-0.1597	0	0.1300	5.447	-4.819
95	-11.734	0.03525	0.06374	0.12612	-0.01939	1.006	0	0.1348	0	0	0	0	0.01689	0.1435	5.341	-4.592
96	-10.259	0.03336	0.05667	0.12798	-0.01747	0.950	0	0.1413	0	0	0	0	0	0.1407	5.235	-4.544
97	-10.151	0.03830	0.09698	0.08485	-0.03527	1.204	0	0	0.0810	0.7707	2.361	-0.1689	0.01551	0.1312	6.215	-5.227
98	-8.825	0.03719	0.09072	0.08800	-0.03420	1.168	0	0	0.0920	0.7184	2.262	-0.1723	0	0.1333	5.874	-5.028
99	-11.930	0.03174	0.07451	0.10896	-0.02458	0.954	0	0	0.1629	0.8736	1.907	0	0.01980	0.1469	5.771	-4.933
100	-10.193	0.02963	0.06435	0.11371	-0.02266	0.885	0	0	0.1772	0.8115	1.787	0	0	0.1478	5.415	-4.700
101	-9.991	0.03727	0.09651	0.08338	-0.03524	1.147	0	0	0.0698	0.8040	0	-0.1600	0.01469	0.1339	5.948	-5.131
102	-8.754	0.03649	0.09095	0.08621	-0.03396	1.117	0	0	0.0798	0.7501	0	-0.1647	0	0.1394	5.488	-4.899
103	-11.751	0.03072	0.07480	0.10784	-0.02536	0.913	0	0	0.1532	0.9040	0	0	0.01933	0.1500	5.650	-4.874
104	-10.069	0.02880	0.06490	0.11240	-0.02320	0.849	0	0	0.1668	0.8388	0	0	0	0.1538	5.284	-4.659
105	-10.053	0.04204	0.09140	0.09427	-0.03080	1.328	0	0	0.1118	0	2.454	-0.1736	0.01433	0.1244	5.836	-4.899
106	-8.838	0.04102	0.08616	0.09636	-0.03020	1.288	0	0	0.1200	0	2.342	-0.1762	0	0.1246	5.684	-4.904
107	-11.833	0.03582	0.06660	0.12067	-0.01987	1.104	0	0	0.1940	0	2.019	0	0.01847	0.1409	5.476	-4.673
108	-10.233	0.03385	0.05831	0.12403	-0.01855	1.032	0	0	0.2036	0	1.889	0	0	0.1438	5.264	-4.603
109	-9.870	0.04121	0.09103	0.09273	-0.03044	1.275	0	0	0.1015	0	0	-0.1656	0.01334	0.1270	5.461	-4.781
110	-8.759	0.04047	0.08648	0.09454	-0.02968	1.241	0	0	0.1084	0	0	-0.1692	0	0.1313	5.300	-4.784
111	-11.630	0.03484	0.06682	0.11964	-0.02039	1.066	0	0	0.1844	0	0	0	0.01786	0.1430	5.347	-4.577
112	-10.099	0.03310	0.05884	0.12276	-0.01886	0.998	0	0	0.1933	0	0	0	0	0.1416	5.122	-4.525
113	-10.156	0.03822	0.09202	0.08875	-0.03300	1.151	0	0	0	0.7922	2.295	-0.1554	0.01390	0.1335	6.127	-5.143
114	-8.951	0.03714	0.08653	0.09109	-0.03176	1.123	0	0	0	0.7445	2.214	-0.1589	0	0.1373	5.858	-4.966
115	-11.772	0.03094	0.06995	0.11295	-0.02258	0.903	0	0	0	0.8974	1.865	0	0.01826	0.1598	5.801	-4.897
116	-10.151	0.02884	0.06106	0.11630	-0.02024	0.849	0	0	0	0.8376	1.756	0	0	0.1529	5.392	-4.645

117	-10.005	0.03723	0.09154	0.08743	-0.03315	1.099	0	0	0	0.8229	0	-0.1474	0.01317	0.1302	5.817	-5.026
118	-8.879	0.03644	0.08663	0.08952	-0.03176	1.076	0	0	0	0.7736	0	-0.1520	0	0.1448	5.464	-4.902
119	-11.603	0.03000	0.07012	0.11194	-0.02347	0.866	0	0	0	0.9249	0	0	0.01783	0.1625	5.574	-4.840
120	-10.031	0.02807	0.06146	0.11516	-0.02095	0.816	0	0	0	0.8624	0	0	0	0.1568	5.331	-4.609
121	-10.046	0.04197	0.08666	0.09831	-0.02815	1.274	0	0	0	0	2.387	-0.1603	0.01264	0.1235	5.759	-4.834
122	-8.961	0.04100	0.08220	0.09970	-0.02739	1.244	0	0	0	0	2.295	-0.1631	0	0.1304	5.632	-4.787
123	-11.672	0.03505	0.06235	0.12482	-0.01735	1.053	0	0	0	0	1.975	0	0.01685	0.1460	5.404	-4.557
124	-10.200	0.03314	0.05530	0.12694	-0.01567	0.996	0	0	0	0	1.858	0	0	0.1547	5.212	-4.500
125	-9.873	0.04116	0.08626	0.09693	-0.02801	1.226	0	0	0	0	0	-0.1532	0.01175	0.1297	5.487	-4.735
126	-8.880	0.04044	0.08237	0.09812	-0.02714	1.200	0	0	0	0	0	-0.1567	0	0.1346	5.207	-4.693
127	-11.480	0.03415	0.06244	0.12391	-0.01802	1.017	0	0	0	0	0	0	0.01629	0.1456	5.148	-4.471
128	-10.072	0.03243	0.05566	0.12587	-0.01619	0.964	0	0	0	0	0	0	0	0.1471	5.117	-4.431
129	-10.502	0.03737	0.10110	0.08797	-0.03821	0	0.4589	0.0244	0.0771	0.6609	2.441	-0.1791	0.01744	0.1382	6.350	-5.478
130	-8.985	0.03633	0.09277	0.09166	-0.03683	0	0.3580	0.0735	0.0945	0.6251	2.325	-0.1800	0	0.1423	5.990	-5.253
131	-12.270	0.03114	0.07665	0.11221	-0.02644	0	0.2862	0.0813	0.1648	0.8138	1.955	0	0.02117	0.1515	5.956	-5.079
132	-10.374	0.02938	0.06526	0.11698	-0.02427	0	0.1574	0.1320	0.1834	0.7704	1.824	0	0	0.1409	5.521	-4.842
133	-10.345	0.03646	0.10008	0.08682	-0.03793	0	0.4386	-0.0163	0.0681	0.7007	0	-0.1686	0.01656	0.1311	6.140	-5.350
134	-8.931	0.03584	0.09269	0.09012	-0.03632	0	0.3437	0.0293	0.0835	0.6616	0	-0.1715	0	0.1444	5.687	-5.100
135	-12.101	0.03024	0.07678	0.11130	-0.02711	0	0.2873	0.0454	0.1562	0.8445	0	0	0.02072	0.1466	5.858	-5.024
136	-10.261	0.02867	0.06569	0.11586	-0.02468	0	0.1606	0.0955	0.1735	0.7978	0	0	0	0.1465	5.451	-4.795
137	-10.409	0.03985	0.09735	0.09514	-0.03510	0	0.5744	0.0013	0.0988	0	2.539	-0.1858	0.01680	0.1358	5.982	-5.199
138	-8.958	0.03889	0.08946	0.09829	-0.03408	0	0.4724	0.0530	0.1152	0	2.408	-0.1860	0	0.1346	5.827	-5.186
139	-12.190	0.03409	0.06991	0.12250	-0.02259	0	0.4057	0.0676	0.1908	0	2.064	0	0.02029	0.1266	5.780	-4.891
140	-10.395	0.03250	0.05970	0.12649	-0.02092	0	0.2802	0.1204	0.2069	0	1.920	0	0	0.1367	5.409	-4.735
141	-10.232	0.03910	0.09634	0.09410	-0.03454	0	0.5586	-0.0404	0.0913	0	0	-0.1760	0.01578	0.1379	5.771	-5.072
142	-8.896	0.03854	0.08942	0.09685	-0.03331	0	0.4627	0.0076	0.1053	0	0	-0.1780	0	0.1375	5.606	-5.074
143	-12.000	0.03319	0.06997	0.12175	-0.02307	0	0.4105	0.0301	0.1825	0	0	0	0.01974	0.1277	5.473	-4.799
144	-10.272	0.03183	0.06011	0.12548	-0.02114	0	0.2865	0.0823	0.1971	0	0	0	0	0.1378	5.182	-4.657
145	-10.493	0.03698	0.09625	0.09152	-0.03643	0	0.4838	0.0582	0	0.6752	2.387	-0.1656	0.01597	0.1398	6.285	-5.421
146	-9.083	0.03595	0.08878	0.09433	-0.03467	0	0.3933	0.0865	0	0.6403	2.287	-0.1675	0	0.1452	5.928	-5.162
147	-12.107	0.02983	0.07233	0.11568	-0.02470	0	0.3289	0.1062	0	0.8266	1.928	0	0.01994	0.1507	5.854	-4.983

148	-10.303	0.02810	0.06199	0.11910	-0.02183	0	0.2062	0.1335	0	0.7826	1.799	0	0	0.1532	5.490	-4.778
149	-10.346	0.03610	0.09530	0.09054	-0.03631	0	0.4648	0.0163	0	0.7130	0	-0.1561	0.01517	0.1353	6.086	-5.312
150	-9.031	0.03545	0.08862	0.09307	-0.03439	0	0.3793	0.0426	0	0.6752	0	-0.1595	0	0.1487	5.661	-5.089
151	-11.946	0.02902	0.07237	0.11490	-0.02548	0	0.3285	0.0706	0	0.8554	0	0	0.01950	0.1435	5.683	-4.934
152	-10.197	0.02746	0.06231	0.11821	-0.02243	0	0.2083	0.0979	0	0.8085	0	0	0	0.1572	5.329	-4.731
153	-10.385	0.03937	0.09271	0.09870	-0.03314	0	0.6001	0.0438	0	0	2.487	-0.1723	0.01528	0.1378	5.947	-5.164
154	-9.048	0.03841	0.08578	0.10100	-0.03173	0	0.5085	0.0750	0	0	2.374	-0.1734	0	0.1382	5.852	-5.162
155	-12.020	0.03269	0.06607	0.12586	-0.02048	0	0.4482	0.1010	0	0	2.037	0	0.01902	0.1431	5.565	-4.758
156	-10.324	0.03112	0.05696	0.12858	-0.01816	0	0.3285	0.1308	0	0	1.897	0	0	0.1422	5.295	-4.668
157	-10.217	0.03864	0.09174	0.09784	-0.03274	0	0.5849	0.0014	0	0	0	-0.1634	0.01434	0.1363	5.735	-5.038
158	-8.987	0.03805	0.08563	0.09984	-0.03122	0	0.4984	0.0304	0	0	0	-0.1659	0	0.1371	5.576	-5.041
159	-11.837	0.03186	0.06601	0.12526	-0.02109	0	0.4510	0.0642	0	0	0	0	0.01848	0.1390	5.352	-4.675
160	-10.208	0.03051	0.05723	0.12782	-0.01859	0	0.3333	0.0940	0	0	0	0	0	0.1454	5.168	-4.602
161	-10.133	0.03508	0.09930	0.08421	-0.03690	0	0.4267	0	0.0635	0.6960	2.378	-0.1751	0.01670	0.1438	6.139	-5.342
162	-8.709	0.03428	0.09137	0.08808	-0.03533	0	0.3395	0	0.0803	0.6605	2.263	-0.1763	0	0.1402	5.775	-5.138
163	-11.949	0.02950	0.07536	0.10893	-0.02528	0	0.2744	0	0.1524	0.8409	1.900	0	0.02054	0.1527	5.786	-4.958
164	-10.148	0.02806	0.06429	0.11403	-0.02300	0	0.1588	0	0.1715	0.7989	1.767	0	0	0.1437	5.394	-4.749
165	-9.971	0.03412	0.09840	0.08297	-0.03685	0	0.4006	0	0.0546	0.7359	0	-0.1649	0.01582	0.1356	5.938	-5.211
166	-8.645	0.03369	0.09139	0.08643	-0.03508	0	0.3186	0	0.0696	0.6973	0	-0.1678	0	0.1487	5.544	-4.995
167	-11.772	0.02855	0.07555	0.10787	-0.02608	0	0.2692	0	0.1439	0.8711	0	0	0.02007	0.1407	5.667	-4.905
168	-10.027	0.02728	0.06480	0.11276	-0.02355	0	0.1558	0	0.1617	0.8258	0	0	0	0.1489	5.264	-4.708
169	-10.022	0.03762	0.09536	0.09159	-0.03371	0	0.5445	0	0.0861	0	2.484	-0.1821	0.01601	0.1391	5.726	-5.023
170	-8.669	0.03692	0.08794	0.09491	-0.03249	0	0.4569	0	0.1019	0	2.354	-0.1826	0	0.1365	5.566	-5.008
171	-11.862	0.03250	0.06852	0.11941	-0.02134	0	0.3960	0	0.1788	0	2.014	0	0.01964	0.1296	5.570	-4.739
172	-10.163	0.03123	0.05866	0.12373	-0.01952	0	0.2840	0	0.1952	0	1.868	0	0	0.1376	5.259	-4.614
173	-9.838	0.03682	0.09446	0.09043	-0.03336	0	0.5227	0	0.0787	0	0	-0.1726	0.01499	0.1412	5.543	-4.898
174	-8.596	0.03645	0.08798	0.09333	-0.03198	0	0.4403	0	0.0923	0	0	-0.1747	0	0.1375	5.409	-4.922
175	-11.662	0.03154	0.06863	0.11848	-0.02194	0	0.3943	0	0.1706	0	0	0	0.01906	0.1324	5.254	-4.649
176	-10.031	0.03047	0.05913	0.12254	-0.01990	0	0.2840	0	0.1856	0	0	0	0	0.1395	4.963	-4.535
177	-10.154	0.03492	0.09443	0.08814	-0.03513	0	0.4586	0	0	0.7071	2.320	-0.1619	0.01526	0.1414	6.042	-5.274
178	-8.831	0.03408	0.08736	0.09113	-0.03333	0	0.3779	0	0	0.6740	2.223	-0.1637	0	0.1467	5.696	-5.040

179	-11.814	0.02842	0.07106	0.11284	-0.02366	0	0.3223	0	0	0.8522	1.868	0	0.01929	0.1473	5.701	-4.876
180	-10.100	0.02693	0.06111	0.11654	-0.02083	0	0.2095	0	0	0.8110	1.742	0	0	0.1560	5.378	-4.685
181	-9.999	0.03399	0.09357	0.08701	-0.03524	0	0.4334	0	0	0.7448	0	-0.1526	0.01448	0.1358	5.872	-5.174
182	-8.764	0.03347	0.08726	0.08967	-0.03330	0	0.3573	0	0	0.7087	0	-0.1559	0	0.1510	5.477	-4.952
183	-11.644	0.02755	0.07113	0.11186	-0.02455	0	0.3156	0	0	0.8804	0	0	0.01884	0.1462	5.514	-4.830
184	-9.983	0.02620	0.06147	0.11544	-0.02155	0	0.2053	0	0	0.8361	0	0	0	0.1622	5.194	-4.643
185	-10.033	0.03739	0.09075	0.09553	-0.03175	0	0.5782	0	0	0	2.427	-0.1689	0.01455	0.1374	5.707	-5.006
186	-8.785	0.03664	0.08422	0.09801	-0.03028	0	0.4973	0	0	0	2.315	-0.1701	0	0.1405	5.635	-5.005
187	-11.725	0.03135	0.06470	0.12324	-0.01932	0	0.4450	0	0	0	1.981	0	0.01837	0.1418	5.346	-4.618
188	-10.118	0.03002	0.05597	0.12625	-0.01700	0	0.3357	0	0	0	1.843	0	0	0.1485	5.121	-4.542
189	-9.855	0.03660	0.08986	0.09449	-0.03157	0	0.5566	0	0	0	0	-0.1603	0.01361	0.1366	5.517	-4.889
190	-8.709	0.03616	0.08413	0.09664	-0.03000	0	0.4803	0	0	0	0	-0.1627	0	0.1398	5.382	-4.899
191	-11.531	0.03046	0.06467	0.12241	-0.02004	0	0.4413	0	0	0	0	0	0.01781	0.1397	5.185	-4.536
192	-9.990	0.02932	0.05627	0.12526	-0.01756	0	0.3341	0	0	0	0	0	0	0.1493	4.960	-4.478
193	-10.372	0.03875	0.09824	0.08848	-0.03638	0	0	0.1291	0.0842	0.7733	2.382	-0.1687	0.01580	0.1263	6.312	-5.307
194	-9.006	0.03753	0.09169	0.09156	-0.03545	0	0	0.1532	0.0970	0.7195	2.286	-0.1720	0	0.1327	5.817	-5.034
195	-12.145	0.03231	0.07589	0.11202	-0.02571	0	0	0.1453	0.1671	0.8730	1.940	0	0.02003	0.1432	5.877	-5.013
196	-10.367	0.03009	0.06547	0.11661	-0.02392	0	0	0.1669	0.1832	0.8071	1.824	0	0	0.1434	5.556	-4.787
197	-10.230	0.03793	0.09761	0.08722	-0.03612	0	0	0.0833	0.0736	0.8064	0	-0.1598	0.01501	0.1289	5.955	-5.213
198	-8.954	0.03705	0.09178	0.08999	-0.03496	0	0	0.1058	0.0851	0.7509	0	-0.1643	0	0.1409	5.547	-4.959
199	-11.978	0.03144	0.07607	0.11108	-0.02635	0	0	0.1092	0.1579	0.9035	0	0	0.01958	0.1476	5.753	-4.952
200	-10.253	0.02941	0.06592	0.11545	-0.02431	0	0	0.1310	0.1731	0.8348	0	0	0	0.1491	5.366	-4.740
201	-10.258	0.04228	0.09267	0.09800	-0.03188	0	0	0.1348	0.1146	0	2.474	-0.1735	0.01458	0.1226	5.863	-4.968
202	-9.007	0.04115	0.08714	0.10000	-0.03142	0	0	0.1597	0.1243	0	2.365	-0.1759	0	0.1226	5.754	-4.958
203	-12.027	0.03617	0.06797	0.12374	-0.02105	0	0	0.1601	0.1976	0	2.050	0	0.01863	0.1366	5.559	-4.750
204	-10.393	0.03410	0.05945	0.12690	-0.01989	0	0	0.1836	0.2089	0	1.925	0	0	0.1367	5.397	-4.680
205	-10.095	0.04165	0.09217	0.09670	-0.03131	0	0	0.0888	0.1048	0	0	-0.1655	0.01363	0.1197	5.563	-4.854
206	-8.947	0.04082	0.08733	0.09843	-0.03068	0	0	0.1119	0.1130	0	0	-0.1689	0	0.1276	5.386	-4.849
207	-11.837	0.03534	0.06809	0.12292	-0.02143	0	0	0.1229	0.1883	0	0	0	0.01805	0.1377	5.444	-4.659
208	-10.271	0.03349	0.05989	0.12582	-0.02005	0	0	0.1466	0.1988	0	0	0	0	0.1338	5.169	-4.601
209	-10.350	0.03853	0.09326	0.09187	-0.03434	0	0	0.1638	0	0.7919	2.327	-0.1556	0.01426	0.1244	6.195	-5.208

210	-9.102	0.03737	0.08749	0.09417	-0.03308	0	0	0.1714	0	0.7420	2.246	-0.1592	0	0.1387	5.855	-5.030
211	-11.962	0.03129	0.07131	0.11542	-0.02381	0	0	0.1775	0	0.8933	1.908	0	0.01863	0.1542	5.888	-4.977
212	-10.294	0.02912	0.06210	0.11868	-0.02140	0	0	0.1786	0	0.8295	1.798	0	0	0.1499	5.548	-4.721
213	-10.219	0.03775	0.09267	0.09080	-0.03424	0	0	0.1173	0	0.8231	0	-0.1475	0.01355	0.1289	5.918	-5.117
214	-9.051	0.03690	0.08749	0.09287	-0.03283	0	0	0.1245	0	0.7717	0	-0.1522	0	0.1439	5.566	-4.977
215	-11.805	0.03050	0.07142	0.11463	-0.02456	0	0	0.1414	0	0.9215	0	0	0.01819	0.1588	5.625	-4.919
216	-10.188	0.02851	0.06243	0.11776	-0.02197	0	0	0.1433	0	0.8553	0	0	0	0.1569	5.338	-4.682
217	-10.219	0.04200	0.08792	0.10142	-0.02956	0	0	0.1796	0	0	2.420	-0.1605	0.01298	0.1295	5.759	-4.903
218	-9.095	0.04094	0.08321	0.10276	-0.02880	0	0	0.1887	0	0	2.327	-0.1633	0	0.1268	5.658	-4.867
219	-11.837	0.03512	0.06376	0.12716	-0.01870	0	0	0.2014	0	0	2.019	0	0.01716	0.1439	5.433	-4.624
220	-10.325	0.03313	0.05643	0.12916	-0.01699	0	0	0.2051	0	0	1.900	0	0	0.1432	5.361	-4.574
221	-10.066	0.04140	0.08743	0.10032	-0.02917	0	0	0.1332	0	0	0	-0.1533	0.01209	0.1273	5.573	-4.805
222	-9.036	0.04061	0.08329	0.10147	-0.02830	0	0	0.1417	0	0	0	-0.1569	0	0.1329	5.240	-4.746
223	-11.658	0.03437	0.06378	0.12651	-0.01923	0	0	0.1644	0	0	0	0	0.01659	0.1423	5.199	-4.537
224	-10.211	0.03259	0.05673	0.12834	-0.01737	0	0	0.1689	0	0	0	0	0	0.1439	5.088	-4.506
225	-10.073	0.03687	0.09660	0.08533	-0.03466	0	0	0.0719	0.8020	0.8020	2.307	-0.1656	0.01526	0.1332	6.062	-5.170
226	-8.772	0.03583	0.09023	0.08852	-0.03363	0	0	0.0842	0.7511	2.213	2.213	-0.1686	0	0.1379	5.725	-4.946
227	-11.865	0.03094	0.07456	0.10921	-0.02432	0	0	0.1561	0.8990	1.874	1.874	0	0.01948	0.1485	5.738	-4.894
228	-10.159	0.02896	0.06443	0.11393	-0.02250	0	0	0.1722	0.8367	1.759	1.759	0	0	0.1440	5.344	-4.693
229	-9.923	0.03594	0.09609	0.08394	-0.03470	0	0	0.0614	0.8337	0	0	-0.1569	0.01448	0.1325	5.815	-5.081
230	-8.707	0.03520	0.09042	0.08681	-0.03346	0	0	0.0727	0.7811	0	0	-0.1612	0	0.1422	5.333	-4.839
231	-11.693	0.02999	0.07481	0.10812	-0.02510	0	0	0.1469	0.9277	0	0	0	0.01904	0.1528	5.587	-4.840
232	-10.038	0.02817	0.06495	0.11264	-0.02305	0	0	0.1622	0.8625	0	0	0	0	0.1489	5.250	-4.653
233	-9.965	0.04060	0.09096	0.09523	-0.02998	0	0	0.1033	0	2.402	2.402	-0.1708	0.01403	0.1248	5.685	-4.821
234	-8.779	0.03966	0.08559	0.09737	-0.02940	0	0	0.1127	0	2.294	2.294	-0.1730	0	0.1206	5.615	-4.819
235	-11.760	0.03498	0.06656	0.12139	-0.01943	0	0	0.1872	0	1.985	1.985	0	0.01808	0.1399	5.405	-4.608
236	-10.197	0.03317	0.05830	0.12469	-0.01822	0	0	0.1986	0	1.861	1.861	0	0	0.1344	5.194	-4.564
237	-9.791	0.03985	0.09055	0.09376	-0.02970	0	0	0.0937	0	0	0	-0.1630	0.01308	0.1247	5.401	-4.711
238	-8.704	0.03917	0.08588	0.09562	-0.02897	0	0	0.1017	0	0	0	-0.1662	0	0.1266	5.175	-4.706
239	-11.564	0.03407	0.06675	0.12037	-0.01998	0	0	0.1780	0	0	0	0	0.01750	0.1409	5.268	-4.516
240	-10.066	0.03246	0.05880	0.12344	-0.01855	0	0	0.1887	0	0	0	0	0	0.1333	5.033	-4.490

241	-10.085	0.03690	0.09165	0.08923	-0.03260	0	0	0	0	0.8209	2.246	-0.1524	0.01368	0.1360	5.884	-5.046
242	-8.901	0.03587	0.08609	0.09162	-0.03138	0	0	0	0	0.7744	2.168	-0.1557	0	0.1437	5.763	-4.935
243	-11.716	0.03020	0.07005	0.11321	-0.02249	0	0	0	0	0.9201	1.835	0	0.01801	0.1615	5.770	-4.867
244	-10.118	0.02820	0.06118	0.11653	-0.02021	0	0	0	0	0.8604	1.731	0	0	0.1556	5.397	-4.638
245	-9.942	0.03601	0.09115	0.08796	-0.03279	0	0	0	0	0.8502	0	-0.1446	0.01299	0.1336	5.702	-4.964
246	-8.833	0.03524	0.08616	0.09010	-0.03142	0	0	0	0	0.8020	0	-0.1490	0	0.1498	5.342	-4.855
247	-11.552	0.02932	0.07019	0.11220	-0.02337	0	0	0	0	0.9462	0	0	0.01760	0.1592	5.495	-4.813
248	-10.002	0.02747	0.06155	0.11541	-0.02091	0	0	0	0	0.8840	0	0	0	0.1596	5.255	-4.604
249	-9.966	0.04063	0.08627	0.09926	-0.02759	0	0	0	0	0	2.340	-0.1577	0.01239	0.1259	5.578	-4.766
250	-8.905	0.03970	0.08172	0.10070	-0.02684	0	0	0	0	0	2.250	-0.1602	0	0.1297	5.521	-4.718
251	-11.609	0.03426	0.06241	0.12552	-0.01712	0	0	0	0	0	1.945	0	0.01654	0.1460	5.314	-4.501
252	-10.166	0.03247	0.05538	0.12759	-0.01550	0	0	0	0	0	1.832	0	0	0.1464	5.201	-4.461
253	-9.800	0.03989	0.08584	0.09792	-0.02749	0	0	0	0	0	0	-0.1508	0.01153	0.1320	5.359	-4.672
254	-8.828	0.03921	0.08186	0.09916	-0.02664	0	0	0	0	0	0	-0.1540	0	0.1349	5.119	-4.631
255	-11.422	0.03341	0.06248	0.12461	-0.01780	0	0	0	0	0	0	0	0.01600	0.1477	5.026	-4.426
256	-10.041	0.03180	0.05572	0.12653	-0.01602	0	0	0	0	0	0	0	0	0.1471	4.977	-4.397
257	-11.470	0.04602	0.09910	0.06852	0	1.291	0.4308	-0.1082	0.0193	0.5207	2.533	-0.1595	0.01699	0.1388	6.251	-5.559
258	-9.911	0.04459	0.09076	0.07214	0	1.228	0.3342	-0.0522	0.0371	0.4934	2.395	-0.1611	0	0.1367	5.957	-5.246
259	-12.766	0.03761	0.07686	0.09503	0	0.996	0.2777	-0.0080	0.1120	0.7122	2.046	0	0.02084	0.1523	6.100	-5.171
260	-10.817	0.03521	0.06536	0.10061	0	0.903	0.1527	0.0521	0.1323	0.6794	1.897	0	0	0.1473	5.563	-4.896
261	-11.262	0.04500	0.09799	0.06718	0	1.237	0.4071	-0.1435	0.0118	0.5608	0	-0.1497	0.01590	0.1407	6.059	-5.433
262	-9.830	0.04397	0.09074	0.07063	0	1.184	0.3179	-0.0916	0.0280	0.5309	0	-0.1531	0	0.1371	5.690	-5.175
263	-12.572	0.03674	0.07679	0.09350	0	0.962	0.2758	-0.0433	0.1021	0.7416	0	0	0.02023	0.1451	5.808	-5.092
264	-10.702	0.03459	0.06580	0.09906	0	0.874	0.1538	0.0161	0.1218	0.7062	0	0	0	0.1463	5.353	-4.810
265	-11.325	0.04759	0.09582	0.07537	0	1.384	0.5243	-0.1212	0.0409	0	2.609	-0.1671	0.01660	0.1440	6.025	-5.328
266	-9.818	0.04626	0.08791	0.07844	0	1.320	0.4258	-0.0638	0.0573	0	2.461	-0.1681	0	0.1363	5.763	-5.137
267	-12.638	0.03951	0.07060	0.10623	0	1.129	0.3867	-0.0167	0.1432	0	2.136	0	0.02024	0.1367	5.732	-4.858
268	-10.776	0.03733	0.06018	0.11103	0	1.034	0.2636	0.0440	0.1604	0	1.976	0	0	0.1405	5.330	-4.712
269	-11.096	0.04667	0.09470	0.07436	0	1.337	0.5064	-0.1572	0.0353	0	0	-0.1582	0.01542	0.1316	5.719	-5.180
270	-9.725	0.04573	0.08790	0.07723	0	1.282	0.4152	-0.1041	0.0497	0	0	-0.1607	0	0.1387	5.544	-5.037
271	-12.425	0.03862	0.07050	0.10500	0	1.098	0.3887	-0.0530	0.1342	0	0	0	0.01956	0.1399	5.502	-4.767

272	-10.651	0.03671	0.06060	0.10973	0	1.009	0.2681	0.0070	0.1505	0	0	0	0	0.1447	5.196	-4.639
273	-11.431	0.04577	0.09371	0.07301	0	1.233	0.4492	-0.0629	0	0.5368	2.476	-0.1459	0.01523	0.1404	6.200	-5.507
274	-10.012	0.04433	0.08639	0.07614	0	1.185	0.3660	-0.0262	0	0.5115	2.360	-0.1485	0	0.1378	5.985	-5.282
275	-12.574	0.03648	0.07175	0.09967	0	0.945	0.3165	0.0285	0	0.7246	2.018	0	0.01930	0.1447	5.970	-5.069
276	-10.745	0.03399	0.06153	0.10448	0	0.873	0.2013	0.0660	0	0.6939	1.877	0	0	0.1564	5.525	-4.840
277	-11.241	0.04482	0.09273	0.07173	0	1.184	0.4271	-0.1006	0	0.5746	0	-0.1371	0.01425	0.1411	6.020	-5.396
278	-9.937	0.04374	0.08633	0.07473	0	1.144	0.3500	-0.0665	0	0.5471	0	-0.1410	0	0.1405	5.800	-5.218
279	-12.393	0.03574	0.07164	0.09818	0	0.914	0.3133	-0.0073	0	0.7519	0	0	0.01871	0.1475	5.767	-4.999
280	-10.641	0.03347	0.06187	0.10301	0	0.846	0.2012	0.0301	0	0.7187	0	0	0	0.1529	5.317	-4.765
281	-11.268	0.04721	0.09061	0.08000	0	1.325	0.5457	-0.0690	0	0	2.554	-0.1537	0.01482	0.1368	5.862	-5.237
282	-9.904	0.04588	0.08376	0.08262	0	1.275	0.4605	-0.0308	0	0	2.429	-0.1556	0	0.1372	5.757	-5.126
283	-12.432	0.03814	0.06599	0.11103	0	1.073	0.4274	0.0282	0	0	2.106	0	0.01870	0.1326	5.722	-4.840
284	-10.693	0.03590	0.05683	0.11512	0	1.001	0.3136	0.0666	0	0	1.956	0	0	0.1470	5.406	-4.707
285	-11.055	0.04634	0.08962	0.07904	0	1.282	0.5286	-0.1068	0	0	0	-0.1456	0.01374	0.1374	5.654	-5.120
286	-9.815	0.04537	0.08369	0.08149	0	1.240	0.4496	-0.0714	0	0	0	-0.1487	0	0.1400	5.534	-4.998
287	-12.233	0.03737	0.06583	0.10985	0	1.044	0.4276	-0.0082	0	0	0	0	0.01804	0.1310	5.502	-4.751
288	-10.578	0.03538	0.05713	0.11391	0	0.977	0.3165	0.0300	0	0	0	0	0	0.1485	5.191	-4.634
289	-10.994	0.04299	0.09731	0.06433	0	1.224	0.3730	0	0.0059	0.5639	2.481	-0.1552	0.01603	0.1394	6.016	-5.377
290	-9.553	0.04185	0.08960	0.06823	0	1.181	0.2936	0	0.0237	0.5365	2.348	-0.1574	0	0.1403	5.851	-5.130
291	-12.377	0.03545	0.07563	0.09168	0	0.966	0.2498	0	0.1008	0.7442	2.002	0	0.02009	0.1529	5.898	-5.036
292	-10.539	0.03340	0.06456	0.09773	0	0.893	0.1407	0	0.1223	0.7122	1.851	0	0	0.1528	5.345	-4.748
293	-10.788	0.04194	0.08632	0.06285	0	1.164	0.3441	0	-0.0021	0.6033	0	-0.1457	0.01495	0.1427	5.832	-5.256
294	-9.467	0.04115	0.08966	0.06652	0	1.128	0.2711	0	0.0142	0.5736	0	-0.1495	0	0.1425	5.533	-5.027
295	-12.178	0.03455	0.07565	0.08994	0	0.924	0.2416	0	0.0905	0.7730	0	0	0.01946	0.1434	5.630	-4.961
296	-10.418	0.03271	0.06509	0.09595	0	0.856	0.1355	0	0.1113	0.7384	0	0	0	0.1494	5.202	-4.686
297	-10.827	0.04463	0.09372	0.07159	0	1.321	0.4720	0	0.0291	0	2.564	-0.1634	0.01559	0.1406	5.715	-5.123
298	-9.443	0.04360	0.08650	0.07494	0	1.277	0.3912	0	0.0455	0	2.421	-0.1649	0	0.1376	5.591	-4.961
299	-12.239	0.03740	0.06916	0.10326	0	1.101	0.3627	0	0.1331	0	2.095	0	0.01947	0.1377	5.514	-4.705
300	-10.490	0.03557	0.05920	0.10853	0	1.027	0.2557	0	0.1512	0	1.934	0	0	0.1446	5.161	-4.579
301	-10.597	0.04368	0.09273	0.07040	0	1.267	0.4486	0	0.0231	0	0	-0.1546	0.01441	0.1341	5.485	-4.979
302	-9.343	0.04299	0.08656	0.07350	0	1.230	0.3741	0	0.0375	0	0	-0.1576	0	0.1422	5.314	-4.861

303	-12.019	0.03647	0.06915	0.10178	0	1.061	0.3583	0	0.1236	0	0	0	0.01876	0.1374	5.259	-4.616
304	-10.357	0.03488	0.05970	0.10697	0	0.993	0.2539	0	0.1410	0	0	0	0	0.1459	5.009	-4.507
305	-10.989	0.04303	0.09186	0.06915	0	1.182	0.4005	0	0	0.5750	2.423	-0.1423	0.01440	0.1399	6.001	-5.341
306	-9.673	0.04181	0.08510	0.07248	0	1.146	0.3302	0	0	0.5507	2.311	-0.1451	0	0.1422	5.812	-5.126
307	-12.219	0.03459	0.07049	0.09666	0	0.927	0.2956	0	0	0.7541	1.969	0	0.01861	0.1501	5.803	-4.954
308	-10.490	0.03238	0.06072	0.10182	0	0.866	0.1925	0	0	0.7252	1.829	0	0	0.1578	5.352	-4.712
309	-10.796	0.04204	0.09097	0.06766	0	1.126	0.3725	0	0	0.6117	0	-0.1336	0.01342	0.1393	5.781	-5.230
310	-9.588	0.04114	0.08508	0.07080	0	1.097	0.3075	0	0	0.5853	0	-0.1376	0	0.1483	5.591	-5.056
311	-12.030	0.03380	0.07044	0.09491	0	0.888	0.2858	0	0	0.7804	0	0	0.01801	0.1504	5.593	-4.890
312	-10.375	0.03178	0.06111	0.10007	0	0.832	0.1859	0	0	0.7492	0	0	0	0.1567	5.186	-4.659
313	-10.810	0.04455	0.08854	0.07656	0	1.279	0.5030	0	0	0	2.505	-0.1506	0.01395	0.1406	5.632	-5.050
314	-9.552	0.04345	0.08226	0.07938	0	1.242	0.4313	0	0	0	2.385	-0.1527	0	0.1396	5.571	-4.960
315	-12.073	0.03631	0.06457	0.10846	0	1.058	0.4118	0	0	0	2.060	0	0.01801	0.1325	5.509	-4.694
316	-10.434	0.03436	0.05586	0.11291	0	0.999	0.3103	0	0	0	1.911	0	0	0.1502	5.244	-4.580
317	-10.592	0.04364	0.08764	0.07535	0	1.228	0.4798	0	0	0	0	-0.1426	0.01288	0.1408	5.413	-4.934
318	-9.453	0.04285	0.08224	0.07797	0	1.198	0.4135	0	0	0	0	-0.1459	0	0.1422	5.328	-4.866
319	-11.865	0.03549	0.06447	0.10698	0	1.022	0.4052	0	0	0	0	0	0.01733	0.1345	5.294	-4.605
320	-10.307	0.03375	0.05620	0.11139	0	0.967	0.3066	0	0	0	0	0	0	0.1511	5.021	-4.506
321	-11.277	0.04678	0.09688	0.06929	0	1.235	0	-07	0.0326	0.6309	2.459	-0.1512	0.01546	0.1365	6.267	-5.397
322	-9.884	0.04531	0.09019	0.07236	0	1.186	0	0.0282	0.0445	0.5841	2.344	-0.1546	0	0.1352	6.036	-5.172
323	-12.618	0.03846	0.07609	0.09517	0	0.962	0	0.0574	0.1181	0.7723	2.026	0	0.01976	0.1459	5.955	-5.095
324	-10.798	0.03576	0.06557	0.10041	0	0.884	0	0.0875	0.1341	0.7160	1.892	0	0	0.1467	5.502	-4.833
325	-11.089	0.04585	0.09613	0.06788	0	1.186	0	-0.0424	0.0232	0.6638	0	-0.1429	0.01447	0.1389	5.971	-5.289
326	-9.807	0.04471	0.09029	0.07083	0	1.145	0	-0.0153	0.0342	0.6165	0	-0.1476	0	0.1394	5.738	-5.107
327	-12.429	0.03764	0.07610	0.09362	0	0.928	0	0.0213	0.1076	0.8009	0	0	0.01916	0.1482	5.708	-5.015
328	-10.683	0.03516	0.06603	0.09885	0	0.855	0	0.0517	0.1235	0.7427	0	0	0	0.1477	5.361	-4.752
329	-11.073	0.04906	0.09202	0.07878	0	1.338	0	0.0137	0.0640	0	2.530	-0.1583	0.01458	0.1381	5.875	-5.048
330	-9.780	0.04769	0.08632	0.08076	0	1.286	0	0.0418	0.0726	0	2.406	-0.1609	0	0.1243	5.804	-4.972
331	-12.435	0.04102	0.06864	0.10824	0	1.094	0	0.0772	0.1556	0	2.115	0	0.01868	0.1267	5.640	-4.876
332	-10.746	0.03854	0.05992	0.11195	0	1.012	0	0.1071	0.1664	0	1.974	0	0	0.1397	5.357	-4.729
333	-10.865	0.04826	0.09138	0.07759	0	1.295	0	-0.0277	0.0560	0	0	-0.1509	0.01348	0.1389	5.536	-4.942

334	-9.691	0.04720	0.08650	0.07947	0	1.250	0	-0.0016	0.0635	0	0	-0.1545	0	0.1234	5.505	-4.850
335	-12.226	0.04020	0.06864	0.10698	0	1.063	0	0.0408	0.1459	0	0	0	0.01798	0.1284	5.432	-4.784
336	-10.622	0.03798	0.06037	0.11064	0	0.986	0	0.0708	0.1563	0	0	0	0	0.1385	5.223	-4.652
337	-11.219	0.04652	0.09149	0.07376	0	1.175	0	0.0462	0	0.6519	2.402	-0.1382	0.01369	0.1397	6.208	-5.341
338	-9.970	0.04511	0.08570	0.07638	0	1.138	0	0.0603	0	0.6103	2.307	-0.1420	0	0.1376	6.018	-5.161
339	-12.403	0.03748	0.07079	0.09985	0	0.907	0	0.1015	0	0.7930	1.993	0	0.01809	0.1558	5.882	-4.982
340	-10.718	0.03477	0.06166	0.10427	0	0.848	0	0.1122	0	0.7414	1.870	0	0	0.1499	5.541	-4.827
341	-11.048	0.04567	0.09083	0.07242	0	1.131	0	0.0026	0	0.6826	0	-0.1307	0.01280	0.1401	5.861	-5.245
342	-9.899	0.04456	0.08575	0.07494	0	1.100	0	0.0160	0	0.6405	0	-0.1354	0	0.1437	5.756	-5.097
343	-12.229	0.03678	0.07076	0.09836	0	0.876	0	0.0645	0	0.8190	0	0	0.01751	0.1583	5.653	-4.913
344	-10.615	0.03427	0.06202	0.10280	0	0.821	0	0.0762	0	0.7658	0	0	0	0.1546	5.407	-4.771
345	-10.990	0.04867	0.08684	0.08351	0	1.276	0	0.0699	0	0	2.475	-0.1456	0.01277	0.1389	5.849	-4.993
346	-9.847	0.04739	0.08202	0.08513	0	1.237	0	0.0835	0	0	2.371	-0.1487	0	0.1255	5.755	-4.913
347	-12.204	0.03986	0.06375	0.11329	0	1.035	0	0.1310	0	0	2.082	0	0.01699	0.1454	5.680	-4.813
348	-10.658	0.03743	0.05635	0.11633	0	0.974	0	0.1418	0	0	1.952	0	0	0.1457	5.400	-4.675
349	-10.798	0.04793	0.08628	0.08238	0	1.237	0	0.0270	0	0	0	-0.1390	0.01176	0.1355	5.523	-4.883
350	-9.764	0.04693	0.08215	0.08392	0	1.204	0	0.0397	0	0	0	-0.1427	0	0.1278	5.431	-4.838
351	-12.011	0.03915	0.06370	0.11209	0	1.007	0	0.0940	0	0	0	0	0.01631	0.1412	5.428	-4.728
352	-10.544	0.03695	0.05669	0.11511	0	0.950	0	0.1056	0	0	0	0	0	0.1457	5.220	-4.603
353	-10.883	0.04413	0.09541	0.06582	0	1.200	0	0	0.0201	0.6626	2.404	-0.1485	0.01481	0.1412	6.047	-5.248
354	-9.565	0.04285	0.08904	0.06909	0	1.162	0	0	0.0324	0.6187	2.293	-0.1519	0	0.1370	5.856	-5.020
355	-12.278	0.03651	0.07488	0.09239	0	0.951	0	0	0.1082	0.8003	1.973	0	0.01918	0.1494	5.758	-4.972
356	-10.537	0.03407	0.06469	0.09787	0	0.884	0	0	0.1250	0.7471	1.841	0	0	0.1474	5.311	-4.704
357	-10.694	0.04312	0.09476	0.06420	0	1.144	0	0	0.0101	0.6932	0	-0.1403	0.01384	0.1388	5.774	-5.144
358	-9.481	0.04213	0.08921	0.06730	0	1.112	0	0	0.0216	0.6487	0	-0.1449	0	0.1425	5.524	-4.956
359	-12.086	0.03561	0.07498	0.09061	0	0.910	0	0	0.0972	0.8269	0	0	0.01857	0.1524	5.538	-4.898
360	-10.417	0.03337	0.06523	0.09608	0	0.848	0	0	0.1139	0.7717	0	0	0	0.1512	5.211	-4.655
361	-10.678	0.04661	0.09035	0.07589	0	1.313	0	0	0.0536	0	2.477	-0.1560	0.01392	0.1374	5.631	-4.877
362	-9.461	0.04544	0.08496	0.07809	0	1.271	0	0	0.0626	0	2.356	-0.1587	0	0.1241	5.632	-4.822
363	-12.103	0.03925	0.06726	0.10612	0	1.093	0	0	0.1474	0	2.061	0	0.01810	0.1311	5.454	-4.741
364	-10.493	0.03705	0.05884	0.11012	0	1.022	0	0	0.1590	0	1.922	0	0	0.1429	5.180	-4.605

365	-10.466	0.04572	0.08982	0.07442	0	1.260	0	0	0.0449	0	0	-0.1488	0.01283	0.1419	5.313	-4.782
366	-9.364	0.04482	0.08521	0.07649	0	1.225	0	0	0.0529	0	0	-0.1524	0	0.1271	5.328	-4.731
367	-11.891	0.03836	0.06736	0.10458	0	1.054	0	0	0.1372	0	0	0	0.01739	0.1314	5.253	-4.654
368	-10.363	0.03638	0.05938	0.10853	0	0.988	0	0	0.1485	0	0	0	0	0.1441	5.049	-4.528
369	-10.860	0.04418	0.08999	0.07077	0	1.154	0	0	0	0.6828	2.341	-0.1357	0.01310	0.1407	6.017	-5.200
370	-9.680	0.04291	0.08449	0.07349	0	1.123	0	0	0	0.6441	2.250	-0.1394	0	0.1394	5.886	-5.056
371	-12.100	0.03584	0.06960	0.09760	0	0.908	0	0	0	0.8214	1.933	0	0.01751	0.1618	5.691	-4.870
372	-10.489	0.03333	0.06082	0.10212	0	0.853	0	0	0	0.7730	1.814	0	0	0.1537	5.370	-4.725
373	-10.684	0.04324	0.08940	0.06914	0	1.102	0	0	0	0.7106	0	-0.1283	0.01223	0.1381	5.683	-5.109
374	-9.597	0.04223	0.08458	0.07174	0	1.077	0	0	0	0.6712	0	-0.1329	0	0.1451	5.577	-4.976
375	-11.921	0.03505	0.06963	0.09582	0	0.870	0	0	0	0.8450	0	0	0.01695	0.1613	5.509	-4.806
376	-10.376	0.03272	0.06122	0.10036	0	0.820	0	0	0	0.7948	0	0	0	0.1583	5.296	-4.670
377	-10.637	0.04656	0.08521	0.08123	0	1.266	0	0	0	0	2.413	-0.1436	0.01216	0.1375	5.634	-4.833
378	-9.562	0.04543	0.08067	0.08298	0	1.233	0	0	0	0	2.313	-0.1465	0	0.1272	5.578	-4.762
379	-11.916	0.03843	0.06241	0.11189	0	1.048	0	0	0	0	2.018	0	0.01640	0.1514	5.474	-4.686
380	-10.442	0.03622	0.05533	0.11505	0	0.991	0	0	0	0	1.893	0	0	0.1501	5.181	-4.551
381	-10.439	0.04572	0.08473	0.07976	0	1.218	0	0	0	0	0	-0.1371	0.01117	0.1372	5.332	-4.740
382	-9.467	0.04484	0.08083	0.08140	0	1.190	0	0	0	0	0	-0.1406	0	0.1308	5.205	-4.686
383	-11.718	0.03764	0.06243	0.11035	0	1.011	0	0	0	0	0	0	0.01575	0.1442	5.244	-4.605
384	-10.319	0.03563	0.05571	0.11349	0	0.959	0	0	0	0	0	0	0	0.1480	5.099	-4.481
385	-11.327	0.04421	0.09850	0.06876	0	0	0.4055	-0.0544	0.0109	0.5622	2.479	-0.1554	0.01659	0.1359	6.162	-5.464
386	-9.819	0.04291	0.09028	0.07249	0	0	0.3107	-0.0019	0.0300	0.5355	2.348	-0.1569	0	0.1337	5.802	-5.178
387	-12.665	0.03660	0.07691	0.09505	0	0	0.2617	0.0329	0.1050	0.7421	2.017	0	0.02045	0.1468	5.929	-5.123
388	-10.764	0.03440	0.06554	0.10057	0	0	0.1386	0.0877	0.1272	0.7081	1.874	0	0	0.1447	5.520	-4.841
389	-11.133	0.04330	0.09739	0.06748	0	0	0.3838	-0.0914	0.0039	0.6001	0	-0.1460	0.01556	0.1371	5.931	-5.347
390	-9.744	0.04237	0.09022	0.07102	0	0	0.2960	-0.0424	0.0213	0.5709	0	-0.1492	0	0.1325	5.580	-5.107
391	-12.478	0.03580	0.07681	0.09354	0	0	0.2605	-0.0036	0.0955	0.7699	0	0	0.01986	0.1427	5.674	-5.048
392	-10.653	0.03382	0.06595	0.09905	0	0	0.1403	0.0509	0.1169	0.7334	0	0	0	0.1411	5.290	-4.770
393	-11.160	0.04572	0.09506	0.07623	0	0	0.5053	-0.0657	0.0333	0	2.559	-0.1638	0.01617	0.1266	5.859	-5.205
394	-9.708	0.04454	0.08726	0.07941	0	0	0.4089	-0.0116	0.0510	0	2.417	-0.1645	0	0.1349	5.667	-5.049
395	-12.521	0.03840	0.07049	0.10682	0	0	0.3739	0.0286	0.1366	0	2.107	0	0.01979	0.1348	5.599	-4.788

396	-10.713	0.03646	0.06021	0.11152	0	0	0.2529	0.0839	0.1557	0	1.954	0	0	0.1436	5.302	-4.657
397	-10.944	0.04490	0.09396	0.07524	0	0	0.4887	-0.1031	0.0281	0	0	-0.1552	0.01503	0.1309	5.596	-5.066
398	-9.620	0.04408	0.08723	0.07821	0	0	0.3993	-0.0529	0.0437	0	0	-0.1575	0	0.1355	5.392	-4.954
399	-12.316	0.03757	0.07037	0.10559	0	0	0.3763	-0.0088	0.1278	0	0	0	0.01913	0.1263	5.392	-4.701
400	-10.591	0.03587	0.06061	0.11023	0	0	0.2578	0.0461	0.1460	0	0	0	0	0.1446	5.087	-4.588
401	-11.304	0.04413	0.09311	0.07323	0	0	0.4252	-0.0170	0	0.5745	2.426	-0.1423	0.01490	0.1380	6.113	-5.424
402	-9.925	0.04278	0.08590	0.07644	0	0	0.3435	0.0170	0	0.5499	2.316	-0.1447	0	0.1383	5.873	-5.214
403	-12.487	0.03559	0.07181	0.09962	0	0	0.3018	0.0619	0	0.7511	1.992	0	0.01899	0.1482	5.915	-5.037
404	-10.695	0.03324	0.06169	0.10440	0	0	0.1881	0.0957	0	0.7196	1.856	0	0	0.1576	5.451	-4.790
405	-11.125	0.04328	0.09214	0.07199	0	0	0.4048	-0.0561	0	0.6104	0	-0.1337	0.01396	0.1396	5.894	-5.318
406	-9.854	0.04227	0.08580	0.07504	0	0	0.3290	-0.0242	0	0.5835	0	-0.1375	0	0.1351	5.626	-5.154
407	-12.312	0.03490	0.07168	0.09815	0	0	0.2992	0.0253	0	0.7769	0	0	0.01842	0.1468	5.665	-4.972
408	-10.593	0.03276	0.06200	0.10295	0	0	0.1885	0.0592	0	0.7433	0	0	0	0.1543	5.280	-4.733
409	-11.121	0.04550	0.08989	0.08080	0	0	0.5272	-0.0208	0	0	2.507	-0.1507	0.01446	0.1364	5.752	-5.138
410	-9.800	0.04427	0.08313	0.08350	0	0	0.4440	0.0148	0	0	2.387	-0.1524	0	0.1382	5.714	-5.044
411	-12.332	0.03714	0.06595	0.11151	0	0	0.4156	0.0656	0	0	2.080	0	0.01835	0.1301	5.573	-4.775
412	-10.634	0.03508	0.05689	0.11553	0	0	0.3034	0.1001	0	0	1.935	0	0	0.1474	5.341	-4.655
413	-10.918	0.04472	0.08892	0.07985	0	0	0.5114	-0.0598	0	0	0	-0.1428	0.01342	0.1366	5.545	-5.018
414	-9.716	0.04383	0.08306	0.08237	0	0	0.4340	-0.0267	0	0	0	-0.1458	0	0.1417	5.379	-4.934
415	-12.138	0.03642	0.06577	0.11032	0	0	0.4162	0.0283	0	0	0	0	0.01771	0.1330	5.394	-4.688
416	-10.521	0.03458	0.05717	0.11433	0	0	0.3067	0.0629	0	0	0	0	0	0.1466	5.070	-4.584
417	-10.897	0.04152	0.09677	0.06505	0	0	0.3604	0	-0.0011	0.6018	2.425	-0.1518	0.01575	0.1386	5.949	-5.298
418	-9.490	0.04047	0.08910	0.06903	0	0	0.2812	0	0.0179	0.5754	2.297	-0.1537	0	0.1307	5.668	-5.071
419	-12.305	0.03463	0.07564	0.09207	0	0	0.2423	0	0.0949	0.7724	1.968	0	0.01978	0.1483	5.744	-4.998
420	-10.503	0.03274	0.06466	0.09804	0	0	0.1336	0	0.1179	0.7397	1.822	0	0	0.1477	5.303	-4.719
421	-10.705	0.04059	0.09578	0.06363	0	0	0.3331	0	-0.0085	0.6390	0	-0.1425	0.01472	0.1352	5.728	-5.185
422	-9.411	0.03985	0.08911	0.06736	0	0	0.2600	0	0.0088	0.6102	0	-0.1460	0	0.1377	5.398	-4.976
423	-12.113	0.03379	0.07563	0.09035	0	0	0.2346	0	0.0850	0.7995	0	0	0.01917	0.1406	5.498	-4.928
424	-10.386	0.03209	0.06515	0.09628	0	0	0.1290	0	0.1073	0.7643	0	0	0	0.1484	5.140	-4.659
425	-10.711	0.04310	0.09308	0.07292	0	0	0.4655	0	0.0227	0	2.511	-0.1606	0.01529	0.1338	5.581	-5.019
426	-9.365	0.04218	0.08588	0.07636	0	0	0.3852	0	0.0403	0	2.372	-0.1619	0	0.1381	5.472	-4.885

427	-12.155	0.03649	0.06905	0.10426	0	0	0.3590	0	0.1274	0	2.060	0	0.01911	0.1359	5.383	-4.643
428	-10.447	0.03485	0.05918	0.10940	0	0	0.2527	0	0.1473	0	1.905	0	0	0.1461	5.070	-4.530
429	-10.495	0.04225	0.09210	0.07176	0	0	0.4431	0	0.0172	0	0	-0.1521	0.01415	0.1389	5.380	-4.883
430	-9.272	0.04164	0.08591	0.07493	0	0	0.3689	0	0.0327	0	0	-0.1548	0	0.1404	5.173	-4.792
431	-11.943	0.03562	0.06901	0.10278	0	0	0.3548	0	0.1183	0	0	0	0.01843	0.1284	5.178	-4.558
432	-10.318	0.03420	0.05965	0.10785	0	0	0.2510	0	0.1373	0	0	0	0	0.1444	4.914	-4.461
433	-10.901	0.04168	0.09136	0.06980	0	0	0.3874	0	0	0.6104	2.370	-0.1391	0.01415	0.1388	5.908	-5.270
434	-9.614	0.04052	0.08463	0.07319	0	0	0.3175	0	0	0.5870	2.263	-0.1417	0	0.1364	5.661	-5.069
435	-12.155	0.03384	0.07055	0.09696	0	0	0.2880	0	0	0.7797	1.938	0	0.01835	0.1536	5.745	-4.925
436	-10.456	0.03175	0.06085	0.10206	0	0	0.1853	0	0	0.7505	1.803	0	0	0.1568	5.276	-4.688
437	-10.719	0.04078	0.09046	0.06835	0	0	0.3608	0	0	0.6452	0	-0.1306	0.01322	0.1367	5.716	-5.167
438	-9.534	0.03993	0.08458	0.07154	0	0	0.2961	0	0	0.6196	0	-0.1345	0	0.1373	5.428	-5.005
439	-11.973	0.03311	0.07047	0.09523	0	0	0.2787	0	0	0.8045	0	0	0.01777	0.1496	5.498	-4.862
440	-10.344	0.03120	0.06121	0.10033	0	0	0.1792	0	0	0.7731	0	0	0	0.1591	5.126	-4.639
441	-10.704	0.04313	0.08795	0.07779	0	0	0.4957	0	0	0	2.455	-0.1480	0.01369	0.1413	5.529	-4.966
442	-9.478	0.04210	0.08170	0.08068	0	0	0.4247	0	0	0	2.338	-0.1499	0	0.1417	5.493	-4.888
443	-11.999	0.03547	0.06456	0.10932	0	0	0.4077	0	0	0	2.028	0	0.01771	0.1350	5.377	-4.634
444	-10.394	0.03366	0.05592	0.11368	0	0	0.3069	0	0	0	1.884	0	0	0.1512	5.148	-4.533
445	-10.498	0.04230	0.08706	0.07660	0	0	0.4734	0	0	0	0	-0.1403	0.01265	0.1414	5.324	-4.847
446	-9.385	0.04157	0.08167	0.07928	0	0	0.4077	0	0	0	0	-0.1433	0	0.1455	5.195	-4.801
447	-11.798	0.03470	0.06443	0.10783	0	0	0.4014	0	0	0	0	0	0.01705	0.1357	5.209	-4.550
448	-10.271	0.03309	0.05623	0.11216	0	0	0.3033	0	0	0	0	0	0	0.1452	4.888	-4.462
449	-11.155	0.04513	0.09634	0.06947	0	0	0	0.0446	0.0248	0.6641	2.412	-0.1476	0.01514	0.1347	6.169	-5.320
450	-9.802	0.04374	0.08969	0.07268	0	0	0	0.0715	0.0379	0.6183	2.304	-0.1509	0	0.1361	5.911	-5.110
451	-12.530	0.03750	0.07614	0.09516	0	0	0	0.0933	0.1115	0.7977	1.999	0	0.01942	0.1451	5.827	-5.047
452	-10.749	0.03495	0.06571	0.10040	0	0	0	0.1193	0.1291	0.7407	1.871	0	0	0.1445	5.474	-4.788
453	-10.979	0.04429	0.09556	0.06811	0	0	0	0.0019	0.0160	0.6954	0	-0.1396	0.01420	0.1357	5.775	-5.217
454	-9.728	0.04320	0.08975	0.07118	0	0	0	0.0272	0.0280	0.6490	0	-0.1440	0	0.1385	5.513	-5.049
455	-12.347	0.03673	0.07611	0.09364	0	0	0	0.0562	0.1015	0.8248	0	0	0.01885	0.1504	5.647	-4.970
456	-10.638	0.03438	0.06614	0.09886	0	0	0	0.0827	0.1187	0.7661	0	0	0	0.1450	5.301	-4.729
457	-10.932	0.04737	0.09135	0.07951	0	0	0	0.0619	0.0573	0	2.486	-0.1554	0.01421	0.1298	5.720	-4.958

458	-9.683	0.04609	0.08568	0.08163	0	0	0	0.0882	0.0670	0	2.368	-0.1577	0	0.1238	5.669	-4.898
459	-12.331	0.03998	0.06855	0.10873	0	0	0	0.1177	0.1496	0	2.088	0	0.01827	0.1297	5.597	-4.826
460	-10.690	0.03769	0.05994	0.11242	0	0	0	0.1435	0.1619	0	1.953	0	0	0.1378	5.337	-4.686
461	-10.734	0.04665	0.09070	0.07835	0	0	0	0.0195	0.0497	0	0	-0.1482	0.01315	0.1320	5.385	-4.846
462	-9.597	0.04566	0.08583	0.08034	0	0	0	0.0441	0.0582	0	0	-0.1516	0	0.1267	5.194	-4.794
463	-12.129	0.03922	0.06854	0.10748	0	0	0	0.0803	0.1401	0	0	0	0.01760	0.1305	5.340	-4.738
464	-10.568	0.03715	0.06037	0.11112	0	0	0	0.1066	0.1520	0	0	0	0	0.1373	5.180	-4.608
465	-11.111	0.04502	0.09094	0.07390	0	0	0	0.0841	0	0.6817	2.360	-0.1350	0.01344	0.1407	6.107	-5.269
466	-9.892	0.04367	0.08518	0.07663	0	0	0	0.0967	0	0.6410	2.269	-0.1387	0	0.1399	5.944	-5.117
467	-12.327	0.03663	0.07085	0.09978	0	0	0	0.1303	0	0.8152	1.970	0	0.01783	0.1578	5.821	-4.949
468	-10.672	0.03402	0.06178	0.10421	0	0	0	0.1382	0	0.7634	1.850	0	0	0.1522	5.484	-4.800
469	-10.950	0.04426	0.09027	0.07261	0	0	0	0.0398	0	0.7111	0	-0.1277	0.01258	0.1343	5.748	-5.180
470	-9.824	0.04318	0.08521	0.07522	0	0	0	0.0519	0	0.6699	0	-0.1323	0	0.1439	5.471	-5.042
471	-12.158	0.03597	0.07079	0.09831	0	0	0	0.0927	0	0.8400	0	0	0.01727	0.1583	5.549	-4.883
472	-10.571	0.03355	0.06212	0.10275	0	0	0	0.1016	0	0.7867	0	0	0	0.1542	5.403	-4.745
473	-10.866	0.04712	0.08622	0.08417	0	0	0	0.1109	0	0	2.434	-0.1430	0.01248	0.1364	5.647	-4.908
474	-9.756	0.04590	0.08142	0.08590	0	0	0	0.1233	0	0	2.335	-0.1458	0	0.1281	5.631	-4.834
475	-12.116	0.03892	0.06374	0.11368	0	0	0	0.1639	0	0	2.057	0	0.01667	0.1481	5.609	-4.766
476	-10.605	0.03662	0.05640	0.11671	0	0	0	0.1720	0	0	1.932	0	0	0.1459	5.329	-4.625
477	-10.682	0.04645	0.08565	0.08307	0	0	0	0.0673	0	0	0	-0.1365	0.01150	0.1370	5.305	-4.810
478	-9.675	0.04550	0.08152	0.08470	0	0	0	0.0790	0	0	0	-0.1401	0	0.1306	5.145	-4.763
479	-11.928	0.03826	0.06367	0.11248	0	0	0	0.1262	0	0	0	0	0.01602	0.1404	5.335	-4.683
480	-10.494	0.03617	0.05671	0.11549	0	0	0	0.1352	0	0	0	0	0	0.1427	5.189	-4.555
481	-10.791	0.04276	0.09486	0.06642	0	0	0	0	0.0138	0.6958	2.353	-0.1453	0.01456	0.1366	5.969	-5.178
482	-9.504	0.04153	0.08849	0.06979	0	0	0	0	0.0270	0.6529	2.246	-0.1485	0	0.1349	5.662	-4.966
483	-12.210	0.03572	0.07487	0.09272	0	0	0	0	0.1027	0.8262	1.940	0	0.01888	0.1529	5.663	-4.925
484	-10.502	0.03340	0.06476	0.09817	0	0	0	0	0.1208	0.7724	1.813	0	0	0.1479	5.265	-4.685
485	-10.614	0.04184	0.09420	0.06486	0	0	0	0	0.0043	0.7248	0	-0.1373	0.01363	0.1399	5.592	-5.080
486	-9.426	0.04089	0.08863	0.06806	0	0	0	0	0.0166	0.6812	0	-0.1417	0	0.1384	5.356	-4.906
487	-12.024	0.03488	0.07494	0.09098	0	0	0	0	0.0921	0.8511	0	0	0.01831	0.1552	5.499	-4.855
488	-10.386	0.03275	0.06526	0.09641	0	0	0	0	0.1100	0.7956	0	0	0	0.1483	5.189	-4.638

489	-10.569	0.04521	0.08971	0.07709	0	0	0	0	0.0482	0	2.427	-0.1535	0.01362	0.1299	5.519	-4.795
490	-9.387	0.04411	0.08431	0.07940	0	0	0	0	0.0582	0	2.310	-0.1558	0	0.1250	5.444	-4.753
491	-12.023	0.03840	0.06712	0.10705	0	0	0	0	0.1424	0	2.027	0	0.01773	0.1332	5.361	-4.693
492	-10.453	0.03636	0.05881	0.11098	0	0	0	0	0.1553	0	1.893	0	0	0.1415	5.109	-4.553
493	-10.368	0.04440	0.08917	0.07566	0	0	0	0	0.0400	0	0	-0.1464	0.01257	0.1343	5.193	-4.693
494	-9.295	0.04355	0.08453	0.07782	0	0	0	0	0.0488	0	0	-0.1497	0	0.1298	5.060	-4.666
495	-11.818	0.03757	0.06720	0.10552	0	0	0	0	0.1325	0	0	0	0.01706	0.1341	5.162	-4.610
496	-10.326	0.03572	0.05931	0.10939	0	0	0	0	0.1450	0	0	0	0	0.1381	5.001	-4.479
497	-10.777	0.04291	0.08947	0.07128	0	0	0	0	0	0.7134	2.293	-0.1328	0.01288	0.1390	5.936	-5.135
498	-9.622	0.04168	0.08399	0.07409	0	0	0	0	0	0.6757	2.206	-0.1362	0	0.1401	5.732	-5.005
499	-12.040	0.03512	0.06963	0.09784	0	0	0	0	0	0.8446	1.903	0	0.01726	0.1643	5.634	-4.839
500	-10.456	0.03270	0.06092	0.10234	0	0	0	0	0	0.7960	1.789	0	0	0.1566	5.358	-4.700
501	-10.611	0.04205	0.08887	0.06971	0	0	0	0	0	0.7398	0	-0.1256	0.01205	0.1381	5.548	-5.050
502	-9.544	0.04107	0.08405	0.07238	0	0	0	0	0	0.7014	0	-0.1300	0	0.1455	5.352	-4.939
503	-11.866	0.03439	0.06963	0.09609	0	0	0	0	0	0.8668	0	0	0.01673	0.1607	5.425	-4.777
504	-10.346	0.03214	0.06129	0.10060	0	0	0	0	0	0.8166	0	0	0	0.1546	5.215	-4.648
505	-10.538	0.04524	0.08464	0.08232	0	0	0	0	0	0	2.366	-0.1413	0.01191	0.1362	5.474	-4.754
506	-9.492	0.04417	0.08009	0.08416	0	0	0	0	0	0	2.270	-0.1439	0	0.1303	5.440	-4.693
507	-11.846	0.03764	0.06238	0.11268	0	0	0	0	0	0	1.986	0	0.01610	0.1471	5.386	-4.634
508	-10.405	0.03555	0.05537	0.11580	0	0	0	0	0	0	1.867	0	0	0.1505	5.150	-4.502
509	-10.350	0.04448	0.08414	0.08088	0	0	0	0	0	0	0	-0.1349	0.01095	0.1399	5.141	-4.667
510	-9.402	0.04363	0.08023	0.08260	0	0	0	0	0	0	0	-0.1382	0	0.1324	4.989	-4.618
511	-11.654	0.03690	0.06238	0.11114	0	0	0	0	0	0	0	0	0.01547	0.1459	5.125	-4.553
512	-10.284	0.03499	0.05572	0.11424	0	0	0	0	0	0	0	0	0	0.1500	5.005	-4.435
513	-8.011	0.03786	0	0.10877	-0.03667	1.261	0.4264	-0.0239	0.1107	0.5411	2.431	-0.1630	0.01501	0.1358	5.823	-5.103
514	-6.888	0.03661	0	0.11119	-0.03534	1.210	0.3540	0.0130	0.1247	0.5164	2.344	-0.1651	0	0.1270	5.618	-4.979
515	-10.163	0.03173	0	0.12595	-0.02656	0.991	0.2867	0.0332	0.1862	0.7079	1.960	0	0.01917	0.1206	5.656	-4.845
516	-8.719	0.02979	0	0.12876	-0.02434	0.904	0.1777	0.0821	0.2004	0.6835	1.849	0	0	0.1370	5.220	-4.730
517	-7.890	0.03675	0	0.10755	-0.03623	1.206	0.4091	-0.0664	0.0975	0.5882	0	-0.1524	0.01426	0.1409	5.466	-4.962
518	-6.833	0.03584	0	0.10976	-0.03474	1.160	0.3400	-0.0315	0.1104	0.5595	0	-0.1557	0	0.1331	5.373	-4.901
519	-9.989	0.03075	0	0.12511	-0.02710	0.956	0.2878	-0.0036	0.1753	0.7416	0	0	0.01871	0.1257	5.479	-4.783

520	-8.589	0.02898	0	0.12775	-0.02473	0.873	0.1804	0.0453	0.1889	0.7135	0	0	0	0.1442	5.139	-4.671
521	-8.046	0.04023	0	0.11406	-0.03409	1.362	0.5212	-0.0403	0.1308	0	2.522	-0.1689	0.01461	0.1290	5.692	-4.956
522	-6.952	0.03905	0	0.11607	-0.03304	1.309	0.4476	-0.0019	0.1437	0	2.423	-0.1707	0	0.1270	5.400	-4.872
523	-10.297	0.03459	0	0.13406	-0.02320	1.127	0.3912	0.0214	0.2101	0	2.065	0	0.01870	0.1294	5.525	-4.801
524	-8.887	0.03279	0	0.13644	-0.02134	1.039	0.2851	0.0722	0.2224	0	1.942	0	0	0.1408	5.221	-4.686
525	-7.909	0.03931	0	0.11311	-0.03335	1.314	0.5094	-0.0842	0.1191	0	0	-0.1589	0.01372	0.1257	5.267	-4.841
526	-6.892	0.03846	0	0.11486	-0.03218	1.266	0.4391	-0.0479	0.1306	0	0	-0.1618	0	0.1218	5.172	-4.757
527	-10.108	0.03363	0	0.13346	-0.02356	1.096	0.3963	-0.0169	0.1997	0	0	0	0.01815	0.1279	5.403	-4.726
528	-8.751	0.03204	0	0.13560	-0.02155	1.012	0.2914	0.0340	0.2113	0	0	0	0	0.1395	5.043	-4.614
529	-8.060	0.03696	0	0.11056	-0.03449	1.197	0.4507	0.0253	0	0.5690	2.370	-0.1509	0.01362	0.1420	5.716	-5.010
530	-7.021	0.03579	0	0.11223	-0.03289	1.159	0.3853	0.0448	0	0.5455	2.296	-0.1535	0	0.1363	5.541	-4.970
531	-10.086	0.03018	0	0.12787	-0.02428	0.935	0.3246	0.0732	0	0.7331	1.925	0	0.01804	0.1304	5.616	-4.767
532	-8.702	0.02832	0	0.12965	-0.02154	0.868	0.2208	0.0995	0	0.7065	1.816	0	0	0.1480	5.288	-4.663
533	-7.950	0.03594	0	0.10958	-0.03428	1.147	0.4341	-0.0182	0	0.6125	0	-0.1412	0.01293	0.1437	5.471	-4.912
534	-6.973	0.03507	0	0.11110	-0.03258	1.114	0.3718	0.04	0	0.5854	0	-0.1448	0	0.1412	5.323	-4.865
535	-9.925	0.02931	0	0.12717	-0.02497	0.903	0.3242	0.0366	0	0.7641	0	0	0.01759	0.1340	5.422	-4.713
536	-8.585	0.02760	0	0.12887	-0.02213	0.840	0.2224	0.0634	0	0.7342	0	0	0	0.1522	5.171	-4.606
537	-8.077	0.03928	0	0.11603	-0.03163	1.297	0.5489	0.0139	0	0	2.463	-0.1570	0.01317	0.1277	5.635	-4.940
538	-7.071	0.03819	0	0.11732	-0.03031	1.258	0.4826	0.0355	0	0	2.378	-0.1592	0	0.1236	5.356	-4.823
539	-10.202	0.03298	0	0.13613	-0.02051	1.068	0.4308	0.0675	0	0	2.030	0	0.01751	0.1288	5.497	-4.706
540	-8.859	0.03127	0	0.13750	-0.01818	1.001	0.3296	0.0964	0	0	1.910	0	0	0.1401	5.246	-4.583
541	-7.951	0.03843	0	0.11531	-0.03113	1.254	0.5370	-0.0303	0	0	0	-0.1479	0.01235	0.1305	5.310	-4.817
542	-7.018	0.03764	0	0.11642	-0.02975	1.219	0.4737	-0.0097	0	0	0	-0.1509	0	0.1283	5.146	-4.730
543	-10.026	0.03212	0	0.13568	-0.02103	1.039	0.4339	0.0298	0	0	0	0	0.01697	0.1285	5.342	-4.629
544	-8.737	0.03060	0	0.13692	-0.01861	0.976	0.3344	0.0591	0	0	0	0	0	0.1440	5.048	-4.512
545	-7.672	0.03543	0	0.10443	-0.03558	1.218	0.3874	0	0.0962	0.5816	2.376	-0.1589	0.01428	0.1378	5.624	-4.933
546	-6.623	0.03438	0	0.10699	-0.03414	1.179	0.3255	0	0.1096	0.5573	2.291	-0.1611	0	0.1295	5.391	-4.826
547	-9.857	0.02995	0	0.12217	-0.02554	0.971	0.2667	0	0.1731	0.7392	1.915	0	0.01852	0.1247	5.502	-4.726
548	-8.497	0.02830	0	0.12533	-0.02323	0.899	0.1701	0	0.1877	0.7154	1.801	0	0	0.1423	5.080	-4.625
549	-7.540	0.03427	0	0.10313	-0.03536	1.155	0.3636	0	0.0831	0.6282	0	-0.1485	0.01353	0.1431	5.330	-4.835
550	-6.554	0.03351	0	0.10544	-0.03380	1.121	0.3046	0	0.0955	0.6002	0	-0.1519	0	0.1359	5.191	-4.744

551	-9.673	0.02891	0	0.12119	-0.02622	0.929	0.2613	0	0.1622	0.7724	0	0	0.01803	0.1261	5.308	-4.675
552	-8.356	0.02742	0	0.12418	-0.02377	0.862	0.1666	0	0.1763	0.7448	0	0	0	0.1459	4.994	-4.568
553	-7.695	0.03789	0	0.10996	-0.03287	1.322	0.4861	0	0.1174	0	2.474	-0.1653	0.01384	0.1304	5.512	-4.823
554	-6.680	0.03694	0	0.11210	-0.03170	1.281	0.4236	0	0.1298	0	2.377	-0.1672	0	0.1217	5.234	-4.724
555	-9.988	0.03288	0	0.13050	-0.02206	1.109	0.3740	0	0.1976	0	2.025	0	0.01804	0.1311	5.344	-4.673
556	-8.662	0.03138	0	0.13322	-0.02009	1.037	0.2808	0	0.2103	0	1.899	0	0	0.1435	5.017	-4.570
557	-7.545	0.03691	0	0.10888	-0.03234	1.265	0.4674	0	0.1058	0	0	-0.1556	0.01295	0.1251	5.114	-4.688
558	-6.604	0.03624	0	0.11074	-0.03108	1.230	0.4079	0	0.1169	0	0	-0.1584	0	0.1250	4.982	-4.585
559	-9.786	0.03185	0	0.12971	-0.02254	1.069	0.3724	0	0.1871	0	0	0	0.01745	0.1323	5.217	-4.591
560	-8.515	0.03055	0	0.13221	-0.02045	1.002	0.2806	0	0.1992	0	0	0	0	0.1436	4.878	-4.489
561	-7.761	0.03484	0	0.10671	-0.03338	1.168	0.4219	0	0	0.6050	2.311	-0.1472	0.01294	0.1393	5.555	-4.890
562	-6.788	0.03382	0	0.10850	-0.03179	1.137	0.3638	0	0	0.5827	2.240	-0.1498	0	0.1402	5.341	-4.806
563	-9.818	0.02868	0	0.12461	-0.02334	0.926	0.3127	0	0	0.7619	1.874	0	0.01741	0.1341	5.455	-4.662
564	-8.508	0.02704	0	0.12668	-0.02065	0.868	0.2177	0	0	0.7370	1.766	0	0	0.1490	5.127	-4.570
565	-7.638	0.03374	0	0.10557	-0.03340	1.111	0.3984	0	0	0.6479	0	-0.1378	0.01226	0.1447	5.286	-4.770
566	-6.723	0.03300	0	0.10719	-0.03172	1.084	0.3432	0	0	0.6222	0	-0.1413	0	0.1445	5.097	-4.696
567	-9.645	0.02774	0	0.12372	-0.02416	0.887	0.3058	0	0	0.7921	0	0	0.01695	0.1373	5.266	-4.610
568	-8.378	0.02624	0	0.12570	-0.02137	0.833	0.2131	0	0	0.7639	0	0	0	0.1517	5.019	-4.512
569	-7.770	0.03726	0	0.11241	-0.03038	1.272	0.5243	0	0	0	2.411	-0.1538	0.01248	0.1281	5.432	-4.794
570	-6.833	0.03634	0	0.11383	-0.02906	1.240	0.4660	0	0	0	2.328	-0.1559	0	0.1229	5.164	-4.682
571	-9.934	0.03156	0	0.13309	-0.01943	1.062	0.4226	0	0	0	1.983	0	0.01688	0.1360	5.302	-4.585
572	-8.665	0.03008	0	0.13477	-0.01712	1.005	0.3308	0	0	0	1.864	0	0	0.1455	5.057	-4.469
573	-7.629	0.03633	0	0.11149	-0.03011	1.221	0.5051	0	0	0	0	-0.1449	0.01166	0.1335	5.095	-4.656
574	-6.762	0.03567	0	0.11271	-0.02873	1.193	0.4497	0	0	0	0	-0.1478	0	0.1302	4.933	-4.579
575	-9.744	0.03063	0	0.13241	-0.02008	1.025	0.4189	0	0	0	0	0	0.01632	0.1305	5.169	-4.509
576	-8.529	0.02932	0	0.13395	-0.01768	0.972	0.3291	0	0	0	0	0	0	0.1481	4.877	-4.398
577	-7.954	0.03915	0	0.10854	-0.03520	1.200	0	0.0771	0.1151	0.6483	2.390	-0.1545	0.01376	0.1341	5.711	-4.896
578	-6.917	0.03778	0	0.11078	-0.03421	1.160	0	0.0947	0.1258	0.6106	2.315	-0.1579	0	0.1438	5.602	-4.888
579	-10.065	0.03289	0	0.12558	-0.02576	0.952	0	0.0990	0.1877	0.7682	1.951	0	0.01815	0.1325	5.630	-4.784
580	-8.703	0.03058	0	0.12838	-0.02393	0.881	0	0.1219	0.2000	0.7248	1.850	0	0	0.1471	5.271	-4.693
581	-7.834	0.03810	0	0.10728	-0.03475	1.149	0	0.0304	0.1010	0.6887	0	-0.1451	0.01305	0.1368	5.405	-4.781

582	-6.858	0.03702	0	0.10932	-0.03363	1.114	0	0.0471	0.1110	0.6482	0	-0.1493	0	0.1500	5.201	-4.772
583	-9.890	0.03192	0	0.12471	-0.02627	0.917	0	0.0621	0.1764	0.8015	0	0	0.01768	0.1342	5.395	-4.702
584	-8.572	0.02979	0	0.12734	-0.02430	0.850	0	0.0857	0.1884	0.7548	0	0	0	0.1482	5.130	-4.629
585	-8.009	0.04248	0	0.11550	-0.03145	1.310	0	0.0864	0.1416	0	2.482	-0.1594	0.01296	0.1296	5.527	-4.820
586	-7.025	0.04119	0	0.11703	-0.03086	1.266	0	0.1041	0.1501	0	2.394	-0.1623	0	0.1249	5.426	-4.746
587	-10.199	0.03657	0	0.13486	-0.02162	1.088	0	0.1130	0.2151	0	2.061	0	0.01729	0.1279	5.447	-4.627
588	-8.889	0.03440	0	0.13678	-0.02029	1.013	0	0.1375	0.2240	0	1.950	0	0	0.1325	5.144	-4.591
589	-7.870	0.04165	0	0.11439	-0.03069	1.264	0	0.0394	0.1285	0	0	-0.1508	0.01210	0.1275	5.260	-4.692
590	-6.959	0.04063	0	0.11571	-0.03000	1.225	0	0.0561	0.1361	0	0	-0.1544	0	0.1297	5.007	-4.619
591	-10.007	0.03567	0	0.13419	-0.02189	1.056	0	0.0755	0.2039	0	0	0	0.01669	0.1329	5.124	-4.549
592	-8.752	0.03371	0	0.13589	-0.02044	0.985	0	0.1005	0.2126	0	0	0	0	0.1353	5.000	-4.506
593	-8.001	0.03846	0	0.11026	-0.03283	1.135	0	0.1277	0	0.6805	2.328	-0.1426	0.01230	0.1319	5.703	-4.891
594	-7.057	0.03721	0	0.11180	-0.03163	1.106	0	0.1310	0	0.6459	2.265	-0.1462	0	0.1422	5.553	-4.820
595	-9.980	0.03161	0	0.12745	-0.02336	0.892	0	0.1452	0	0.8000	1.912	0	0.01688	0.1397	5.508	-4.709
596	-8.690	0.02941	0	0.12925	-0.02108	0.840	0	0.1481	0	0.7565	1.816	0	0	0.1513	5.244	-4.617
597	-7.893	0.03750	0	0.10924	-0.03262	1.089	0	0.0803	0	0.7173	0	-0.1341	0.01165	0.1334	5.336	-4.822
598	-7.005	0.03650	0	0.11064	-0.03132	1.064	0	0.0838	0	0.6804	0	-0.1383	0	0.1394	5.151	-4.738
599	-9.820	0.03076	0	0.12675	-0.02403	0.861	0	0.1082	0	0.8302	0	0	0.01642	0.1408	5.323	-4.643
600	-8.573	0.02871	0	0.12844	-0.02164	0.811	0	0.1122	0	0.7840	0	0	0	0.1561	5.122	-4.561
601	-8.039	0.04181	0	0.11749	-0.02872	1.245	0	0.1438	0	0	2.421	-0.1477	0.01143	0.1263	5.472	-4.769
602	-7.155	0.04065	0	0.11841	-0.02791	1.213	0	0.1482	0	0	2.347	-0.1508	0	0.1285	5.394	-4.698
603	-10.101	0.03532	0	0.13702	-0.01875	1.026	0	0.1662	0	0	2.023	0	0.01592	0.1365	5.288	-4.532
604	-8.875	0.03328	0	0.13803	-0.01702	0.971	0	0.1715	0	0	1.918	0	0	0.1393	5.131	-4.486
605	-7.911	0.04104	0	0.11661	-0.02822	1.203	0	0.0964	0	0	0	-0.1400	0.01062	0.1257	5.205	-4.629
606	-7.097	0.04012	0	0.11739	-0.02736	1.176	0	0.1008	0	0	0	-0.1435	0	0.1323	4.993	-4.613
607	-9.924	0.03452	0	0.13652	-0.01921	0.997	0	0.1287	0	0	0	0	0.01535	0.1407	5.106	-4.465
608	-8.752	0.03267	0	0.13739	-0.01739	0.945	0	0.1350	0	0	0	0	0	0.1412	4.989	-4.414
609	-7.680	0.03710	0	0.10482	-0.03374	1.184	0	0	0.1021	0.6808	2.324	-0.1513	0.01321	0.1364	5.559	-4.783
610	-6.697	0.03587	0	0.10714	-0.03272	1.150	0	0	0.1121	0.6454	2.251	-0.1545	0	0.1486	5.382	-4.712
611	-9.805	0.03134	0	0.12227	-0.02453	0.950	0	0	0.1760	0.7968	1.896	0	0.01761	0.1368	5.431	-4.664
612	-8.504	0.02926	0	0.12524	-0.02269	0.886	0	0	0.1883	0.7559	1.795	0	0	0.1456	5.150	-4.594

613	-7.547	0.03594	0	0.10345	-0.03359	1.125	0	0	0.0880	0.7191	0	-0.1422	0.01251	0.1387	5.245	-4.673
614	-6.622	0.03497	0	0.10555	-0.03244	1.096	0	0	0.0976	0.6809	0	-0.1462	0	0.1543	5.015	-4.642
615	-9.622	0.03029	0	0.12126	-0.02520	0.908	0	0	0.1646	0.8282	0	0	0.01714	0.1360	5.211	-4.591
616	-8.364	0.02837	0	0.12408	-0.02322	0.849	0	0	0.1767	0.7839	0	0	0	0.1526	4.944	-4.533
617	-7.743	0.04065	0	0.11218	-0.02975	1.301	0	0	0.1297	0	2.419	-0.1566	0.01239	0.1274	5.335	-4.670
618	-6.815	0.03953	0	0.11379	-0.02911	1.264	0	0	0.1377	0	2.333	-0.1593	0	0.1289	5.246	-4.604
619	-9.954	0.03523	0	0.13198	-0.02014	1.094	0	0	0.2042	0	2.006	0	0.01675	0.1341	5.244	-4.508
620	-8.705	0.03331	0	0.13409	-0.01878	1.027	0	0	0.2132	0	1.895	0	0	0.1387	4.975	-4.471
621	-7.588	0.03969	0	0.11089	-0.02929	1.247	0	0	0.1167	0	0	-0.1483	0.01153	0.1319	5.132	-4.563
622	-6.731	0.03881	0	0.11228	-0.02856	1.215	0	0	0.1240	0	0	-0.1516	0	0.1323	4.833	-4.494
623	-9.751	0.03423	0	0.13112	-0.02059	1.054	0	0	0.1930	0	0	0	0.01615	0.1359	4.971	-4.435
624	-8.558	0.03250	0	0.13302	-0.01910	0.992	0	0	0.2019	0	0	0	0	0.1381	4.789	-4.394
625	-7.768	0.03674	0	0.10714	-0.03129	1.131	0	0	0	0.7125	2.254	-0.1394	0.01172	0.1341	5.552	-4.765
626	-6.875	0.03560	0	0.10873	-0.03017	1.105	0	0	0	0.6804	2.195	-0.1428	0	0.1466	5.398	-4.691
627	-9.760	0.03041	0	0.12480	-0.02214	0.901	0	0	0	0.8288	1.848	0	0.01629	0.1410	5.261	-4.613
628	-8.526	0.02836	0	0.12670	-0.01999	0.850	0	0	0	0.7882	1.757	0	0	0.1565	5.125	-4.531
629	-7.645	0.03566	0	0.10593	-0.03137	1.078	0	0	0	0.7469	0	-0.1312	0.01111	0.1373	5.195	-4.698
630	-6.805	0.03474	0	0.10737	-0.03015	1.056	0	0	0	0.7124	0	-0.1352	0	0.1444	4.992	-4.628
631	-9.590	0.02946	0	0.12389	-0.02296	0.863	0	0	0	0.8568	0	0	0.01586	0.1433	5.204	-4.549
632	-8.397	0.02755	0	0.12570	-0.02070	0.816	0	0	0	0.8134	0	0	0	0.1612	4.948	-4.477
633	-7.818	0.04035	0	0.11484	-0.02690	1.249	0	0	0	0	2.349	-0.1449	0.01084	0.1240	5.291	-4.615
634	-6.988	0.03931	0	0.11582	-0.02616	1.221	0	0	0	0	2.279	-0.1477	0	0.1307	5.247	-4.572
635	-9.899	0.03436	0	0.13490	-0.01725	1.044	0	0	0	0	1.958	0	0.01534	0.1411	5.127	-4.434
636	-8.730	0.03250	0	0.13602	-0.01562	0.991	0	0	0	0	1.857	0	0	0.1423	4.951	-4.383
637	-7.674	0.03945	0	0.11372	-0.02670	1.200	0	0	0	0	0	-0.1375	0.01006	0.1225	5.017	-4.488
638	-6.910	0.03862	0	0.11454	-0.02589	1.176	0	0	0	0	0	-0.1407	0	0.1335	4.851	-4.484
639	-9.712	0.03345	0	0.13415	-0.01788	1.008	0	0	0	0	0	0	0.01478	0.1460	4.983	-4.367
640	-8.595	0.03176	0	0.13515	-0.01615	0.959	0	0	0	0	0	0	0	0.1452	4.823	-4.309
641	-7.893	0.03620	0	0.10847	-0.03599	0	0.3987	0.0257	0.1013	0.5846	2.373	-0.1586	0.01456	0.1401	5.720	-5.014
642	-6.815	0.03509	0	0.11090	-0.03480	0	0.3286	0.0602	0.1169	0.5603	2.293	-0.1605	0	0.1282	5.530	-4.907
643	-10.058	0.03078	0	0.12575	-0.02631	0	0.2689	0.0730	0.1789	0.7392	1.930	0	0.01872	0.1219	5.621	-4.804

644	-8.658	0.02902	0	0.12856	-0.02426	0	0.1631	0.1168	0.1953	0.7132	1.826	0	0	0.1405	5.218	-4.702
645	-7.784	0.03521	0	0.10735	-0.03564	0	0.3834	-0.0179	0.0889	0.6289	0	-0.1484	0.01386	0.1438	5.448	-4.890
646	-6.765	0.03440	0	0.10956	-0.03429	0	0.3164	0.0147	0.1033	0.6008	0	-0.1514	0	0.1332	5.334	-4.821
647	-9.892	0.02986	0	0.12494	-0.02687	0	0.2707	0.0351	0.1685	0.7711	0	0	0.01829	0.1248	5.469	-4.753
648	-8.532	0.02826	0	0.12758	-0.02466	0	0.1664	0.0791	0.1841	0.7416	0	0	0	0.1442	5.112	-4.644
649	-7.915	0.03855	0	0.11422	-0.03316	0	0.4998	0.0114	0.1219	0	2.468	-0.1652	0.01412	0.1287	5.577	-4.850
650	-6.871	0.03753	0	0.11624	-0.03226	0	0.4290	0.0475	0.1366	0	2.375	-0.1666	0	0.1212	5.288	-4.759
651	-10.184	0.03359	0	0.13427	-0.02276	0	0.3768	0.0657	0.2030	0	2.036	0	0.01820	0.1273	5.498	-4.756
652	-8.822	0.03200	0	0.13661	-0.02108	0	0.2740	0.1113	0.2176	0	1.919	0	0	0.1407	5.103	-4.648
653	-7.789	0.03773	0	0.11334	-0.03252	0	0.4895	-0.0334	0.1109	0	0	-0.1556	0.01328	0.1278	5.224	-4.743
654	-6.815	0.03702	0	0.11510	-0.03149	0	0.4217	08	0.1240	0	0	-0.1581	0	0.1247	5.127	-4.669
655	-10.002	0.03268	0	0.13369	-0.02313	0	0.3823	0.0265	0.1928	0	0	0	0.01767	0.1292	5.392	-4.676
656	-8.691	0.03129	0	0.13580	-0.02131	0	0.2806	0.0723	0.2066	0	0	0	0	0.1403	5.000	-4.570
657	-7.958	0.03544	0	0.11037	-0.03400	0	0.4257	0.0672	0	0.6079	2.318	-0.1471	0.01326	0.1419	5.653	-4.931
658	-6.953	0.03437	0	0.11204	-0.03250	0	0.3623	0.0850	0	0.5849	2.249	-0.1495	0	0.1369	5.491	-4.871
659	-9.996	0.02931	0	0.12773	-0.02416	0	0.3090	0.1052	0	0.7606	1.898	0	0.01770	0.1330	5.594	-4.733
660	-8.645	0.02760	0	0.12949	-0.02154	0	0.2072	0.1282	0	0.7332	1.794	0	0	0.1513	5.243	-4.633
661	-7.857	0.03452	0	0.10946	-0.03386	0	0.4109	0.0228	0	0.6491	0	-0.1377	0.01261	0.1454	5.450	-4.847
662	-6.910	0.03374	0	0.11098	-0.03225	0	0.3502	0.0399	0	0.6227	0	-0.1411	0	0.1390	5.249	-4.773
663	-9.841	0.02850	0	0.12706	-0.02486	0	0.3092	0.0678	0	0.7901	0	0	0.01727	0.1368	5.405	-4.682
664	-8.532	0.02692	0	0.12873	-0.02213	0	0.2094	0.0914	0	0.7596	0	0	0	0.1572	5.122	-4.578
665	-7.963	0.03773	0	0.11630	-0.03092	0	0.5295	0.0584	0	0	2.415	-0.1537	0.01278	0.1303	5.525	-4.835
666	-6.995	0.03676	0	0.11760	-0.02971	0	0.4655	0.0783	0	0	2.334	-0.1557	0	0.1239	5.286	-4.736
667	-10.104	0.03204	0	0.13639	-0.02023	0	0.4182	0.1036	0	0	2.004	0	0.01712	0.1333	5.473	-4.657
668	-8.799	0.03050	0	0.13772	-0.01802	0	0.3192	0.1291	0	0	1.889	0	0	0.1440	5.180	-4.535
669	-7.845	0.03697	0	0.11562	-0.03051	0	0.5188	0.0135	0	0	0	-0.1449	0.01199	0.1335	5.261	-4.728
670	-6.946	0.03627	0	0.11674	-0.02922	0	0.4576	0.0325	0	0	0	-0.1477	0	0.1299	5.074	-4.647
671	-9.934	0.03124	0	0.13595	-0.02077	0	0.4216	0.0652	0	0	0	0	0.01660	0.1298	5.305	-4.584
672	-8.680	0.02987	0	0.13715	-0.01846	0	0.3243	0.0913	0	0	0	0	0	0.1463	4.973	-4.466
673	-7.592	0.03407	0	0.10449	-0.03473	0	0.3707	0	0.0878	0.6214	2.315	-0.1550	0.01392	0.1423	5.550	-4.864
674	-6.580	0.03313	0	0.10706	-0.03345	0	0.3100	0	0.1025	0.5979	2.235	-0.1569	0	0.1318	5.337	-4.767

675	-9.781	0.02918	0	0.12227	-0.02519	0	0.2568	0	0.1667	0.7688	1.879	0	0.01814	0.1250	5.477	-4.697
676	-8.456	0.02769	0	0.12540	-0.02305	0	0.1619	0	0.1831	0.7440	1.771	0	0	0.1401	5.066	-4.600
677	-7.472	0.03302	0	0.10328	-0.03462	0	0.3488	0	0.0756	0.6653	0	-0.1450	0.01321	0.1403	5.296	-4.775
678	-6.517	0.03235	0	0.10560	-0.03319	0	0.2909	0	0.0893	0.6381	0	-0.1481	0	0.1375	5.116	-4.655
679	-9.605	0.02821	0	0.12132	-0.02587	0	0.2520	0	0.1562	0.8000	0	0	0.01769	0.1300	5.284	-4.636
680	-8.320	0.02685	0	0.12428	-0.02360	0	0.1590	0	0.1721	0.7717	0	0	0	0.1459	4.976	-4.545
681	-7.605	0.03652	0	0.11048	-0.03178	0	0.4757	0	0.1094	0	2.417	-0.1620	0.01344	0.1305	5.415	-4.725
682	-6.630	0.03569	0	0.11263	-0.03077	0	0.4148	0	0.1232	0	2.324	-0.1635	0	0.1214	5.131	-4.634
683	-9.906	0.03207	0	0.13104	-0.02149	0	0.3681	0	0.1911	0	1.989	0	0.01761	0.1350	5.292	-4.619
684	-8.621	0.03075	0	0.13370	-0.01972	0	0.2767	0	0.2058	0	1.869	0	0	0.1419	4.957	-4.522
685	-7.467	0.03563	0	0.10947	-0.03137	0	0.4583	0	0.0986	0	0	-0.1526	0.01259	0.1287	5.051	-4.599
686	-6.560	0.03507	0	0.11134	-0.03025	0	0.4002	0	0.1110	0	0	-0.1551	0	0.1269	4.922	-4.512
687	-9.713	0.03110	0	0.13027	-0.02200	0	0.3668	0	0.1811	0	0	0	0.01705	0.1308	5.172	-4.535
688	-8.478	0.02996	0	0.13272	-0.02010	0	0.2767	0	0.1950	0	0	0	0	0.1450	4.843	-4.445
689	-7.689	0.03357	0	0.10684	-0.03274	0	0.4060	0	0	0.6415	2.255	-0.1437	0.01263	0.1412	5.531	-4.837
690	-6.746	0.03264	0	0.10864	-0.03127	0	0.3491	0	0	0.6201	2.188	-0.1461	0	0.1429	5.283	-4.723
691	-9.750	0.02796	0	0.12475	-0.02314	0	0.3035	0	0	0.7885	1.841	0	0.01710	0.1379	5.434	-4.631
692	-8.468	0.02645	0	0.12678	-0.02057	0	0.2097	0	0	0.7632	1.738	0	0	0.1512	5.102	-4.544
693	-7.577	0.03258	0	0.10577	-0.03283	0	0.3842	0	0	0.6821	0	-0.1346	0.01199	0.1432	5.253	-4.715
694	-6.687	0.03190	0	0.10740	-0.03126	0	0.3300	0	0	0.6572	0	-0.1379	0	0.1401	5.063	-4.645
695	-9.584	0.02709	0	0.12387	-0.02395	0	0.2971	0	0	0.8171	0	0	0.01667	0.1416	5.256	-4.582
696	-8.343	0.02569	0	0.12583	-0.02129	0	0.2055	0	0	0.7887	0	0	0	0.1526	4.972	-4.489
697	-7.688	0.03597	0	0.11301	-0.02954	0	0.5142	0	0	0	2.358	-0.1508	0.01214	0.1312	5.354	-4.700
698	-6.784	0.03514	0	0.11444	-0.02833	0	0.4574	0	0	0	2.279	-0.1527	0	0.1275	5.082	-4.600
699	-9.861	0.03078	0	0.13367	-0.01906	0	0.4170	0	0	0	1.950	0	0.01653	0.1394	5.279	-4.544
700	-8.625	0.02945	0	0.13529	-0.01687	0	0.3265	0	0	0	1.836	0	0	0.1466	4.968	-4.425
701	-7.557	0.03513	0	0.11213	-0.02935	0	0.4963	0	0	0	0	-0.1422	0.01135	0.1348	5.058	-4.581
702	-6.719	0.03455	0	0.11336	-0.02807	0	0.4421	0	0	0	0	-0.1449	0	0.1333	4.873	-4.509
703	-9.678	0.02991	0	0.13299	-0.01972	0	0.4136	0	0	0	0	0	0.01599	0.1320	5.138	-4.471
704	-8.493	0.02873	0	0.13448	-0.01744	0	0.3250	0	0	0	0	0	0	0.1472	4.849	-4.357
705	-7.856	0.03762	0	0.10832	-0.03466	0	0	0.1173	0.1069	0.6829	2.339	-0.1508	0.01339	0.1359	5.640	-4.838

706	-6.854	0.03634	0	0.11058	-0.03377	0	0	0.1338	0.1189	0.6460	2.269	-0.1539	0	0.1485	5.501	-4.799
707	-9.974	0.03195	0	0.12544	-0.02559	0	0	0.1330	0.1811	0.7947	1.923	0	0.01778	0.1326	5.593	-4.738
708	-8.648	0.02979	0	0.12824	-0.02389	0	0	0.1524	0.1951	0.7504	1.827	0	0	0.1396	5.259	-4.669
709	-7.746	0.03667	0	0.10715	-0.03430	0	0	0.0700	0.0935	0.7214	0	-0.1417	0.01273	0.1375	5.345	-4.728
710	-6.800	0.03566	0	0.10921	-0.03327	0	0	0.0857	0.1047	0.6818	0	-0.1456	0	0.1540	5.126	-4.678
711	-9.806	0.03105	0	0.12460	-0.02611	0	0	0.0952	0.1702	0.8264	0	0	0.01733	0.1336	5.382	-4.666
712	-8.521	0.02905	0	0.12723	-0.02427	0	0	0.1154	0.1838	0.7791	0	0	0	0.1474	5.129	-4.607
713	-7.900	0.04096	0	0.11569	-0.03069	0	0	0.1298	0.1342	0	2.433	-0.1562	0.01255	0.1283	5.429	-4.733
714	-6.957	0.03978	0	0.11724	-0.03019	0	0	0.1465	0.1439	0	2.351	-0.1587	0	0.1281	5.326	-4.662
715	-10.100	0.03561	0	0.13509	-0.02126	0	0	0.1518	0.2088	0	2.033	0	0.01684	0.1292	5.415	-4.592
716	-8.832	0.03361	0	0.13700	-0.02007	0	0	0.1727	0.2194	0	1.927	0	0	0.1315	5.126	-4.550
717	-7.769	0.04021	0	0.11466	-0.03002	0	0	0.0823	0.1217	0	0	-0.1479	0.01172	0.1309	5.181	-4.613
718	-6.895	0.03928	0	0.11599	-0.02942	0	0	0.0982	0.1304	0	0	-0.1511	0	0.1324	4.951	-4.547
719	-9.915	0.03476	0	0.13444	-0.02156	0	0	0.1134	0.1979	0	0	0	0.01627	0.1318	5.114	-4.516
720	-8.699	0.03295	0	0.13613	-0.02024	0	0	0.1350	0.2082	0	0	0	0	0.1328	4.990	-4.467
721	-7.916	0.03706	0	0.11012	-0.03246	0	0	0.1610	0	0.7114	2.282	-0.1394	0.01202	0.1344	5.630	-4.834
722	-6.998	0.03588	0	0.11168	-0.03132	0	0	0.1639	0	0.6777	2.223	-0.1428	0	0.1445	5.483	-4.761
723	-9.902	0.03077	0	0.12735	-0.02330	0	0	0.1721	0	0.8232	1.887	0	0.01660	0.1442	5.496	-4.678
724	-8.639	0.02868	0	0.12914	-0.02110	0	0	0.1729	0	0.7794	1.795	0	0	0.1554	5.253	-4.594
725	-7.816	0.03619	0	0.10916	-0.03231	0	0	0.1133	0	0.7467	0	-0.1311	0.01140	0.1367	5.280	-4.765
726	-6.951	0.03524	0	0.11058	-0.03107	0	0	0.1163	0	0.7106	0	-0.1351	0	0.1404	5.128	-4.674
727	-9.747	0.02997	0	0.12667	-0.02397	0	0	0.1345	0	0.8521	0	0	0.01616	0.1419	5.320	-4.618
728	-8.525	0.02802	0	0.12836	-0.02167	0	0	0.1365	0	0.8057	0	0	0	0.1589	5.119	-4.541
729	-7.943	0.04039	0	0.11776	-0.02815	0	0	0.1806	0	0	2.378	-0.1449	0.01111	0.1317	5.407	-4.687
730	-7.091	0.03932	0	0.11870	-0.02740	0	0	0.1844	0	0	2.307	-0.1477	0	0.1338	5.307	-4.625
731	-10.015	0.03443	0	0.13728	-0.01853	0	0	0.1975	0	0	1.998	0	0.01558	0.1373	5.296	-4.511
732	-8.821	0.03253	0	0.13827	-0.01689	0	0	0.2006	0	0	1.897	0	0	0.1389	5.122	-4.446
733	-7.822	0.03970	0	0.11693	-0.02772	0	0	0.1328	0	0	0	-0.1374	0.01033	0.1304	5.009	-4.545
734	-7.036	0.03885	0	0.11772	-0.02691	0	0	0.1368	0	0	0	-0.1406	0	0.1344	4.957	-4.545
735	-9.843	0.03368	0	0.13679	-0.01901	0	0	0.1593	0	0	0	0	0.01503	0.1430	5.100	-4.445
736	-8.702	0.03194	0	0.13764	-0.01728	0	0	0.1636	0	0	0	0	0	0.1406	4.954	-4.373

737	-7.608	0.03591	0	0.10489	-0.03305	0	0	0	0.0946	0.7150	2.268	-0.1478	0.01288	0.1373	5.508	-4.728
738	-6.657	0.03467	0	0.10722	-0.03213	0	0	0	0.1058	0.6805	2.200	-0.1508	0	0.1527	5.330	-4.656
739	-9.735	0.03058	0	0.12239	-0.02424	0	0	0	0.1700	0.8237	1.861	0	0.01727	0.1350	5.418	-4.634
740	-8.466	0.02863	0	0.12534	-0.02254	0	0	0	0.1838	0.7821	1.766	0	0	0.1444	5.147	-4.572
741	-7.486	0.03476	0	0.10361	-0.03299	0	0	0	0.0814	0.7513	0	-0.1391	0.01223	0.1450	5.198	-4.621
742	-6.588	0.03385	0	0.10573	-0.03193	0	0	0	0.0920	0.7141	0	-0.1428	0	0.1436	4.979	-4.577
743	-9.560	0.02960	0	0.12141	-0.02493	0	0	0	0.1591	0.8532	0	0	0.01682	0.1365	5.201	-4.574
744	-8.331	0.02778	0	0.12421	-0.02308	0	0	0	0.1726	0.8086	0	0	0	0.1496	4.937	-4.513
745	-7.663	0.03940	0	0.11270	-0.02884	0	0	0	0.1230	0	2.365	-0.1536	0.01202	0.1292	5.265	-4.593
746	-6.771	0.03837	0	0.11433	-0.02829	0	0	0	0.1320	0	2.284	-0.1560	0	0.1332	5.175	-4.532
747	-9.879	0.03446	0	0.13254	-0.01966	0	0	0	0.1984	0	1.971	0	0.01634	0.1316	5.227	-4.473
748	-8.667	0.03268	0	0.13462	-0.01844	0	0	0	0.2089	0	1.866	0	0	0.1346	4.976	-4.435
749	-7.518	0.03852	0	0.11149	-0.02847	0	0	0	0.1106	0	0	-0.1456	0.01120	0.1343	4.968	-4.493
750	-6.693	0.03771	0	0.11290	-0.02782	0	0	0	0.1189	0	0	-0.1486	0	0.1360	4.775	-4.417
751	-9.684	0.03352	0	0.13170	-0.02013	0	0	0	0.1876	0	0	0	0.01577	0.1353	4.969	-4.403
752	-8.525	0.03192	0	0.13357	-0.01879	0	0	0	0.1979	0	0	0	0	0.1362	4.781	-4.360
753	-7.703	0.03555	0	0.10726	-0.03080	0	0	0	0	0.7437	2.204	-0.1363	0.01146	0.1358	5.487	-4.714
754	-6.836	0.03446	0	0.10888	-0.02974	0	0	0	0	0.7125	2.148	-0.1395	0	0.1442	5.343	-4.634
755	-9.697	0.02970	0	0.12495	-0.02201	0	0	0	0	0.8528	1.817	0	0.01602	0.1454	5.261	-4.584
756	-8.489	0.02775	0	0.12683	-0.01994	0	0	0	0	0.8120	1.730	0	0	0.1548	5.119	-4.511
757	-7.590	0.03456	0	0.10613	-0.03093	0	0	0	0	0.7764	0	-0.1284	0.01088	0.1409	5.154	-4.652
758	-6.771	0.03367	0	0.10759	-0.02978	0	0	0	0	0.7429	0	-0.1322	0	0.1482	4.916	-4.543
759	-9.534	0.02881	0	0.12406	-0.02282	0	0	0	0	0.8793	0	0	0.01561	0.1475	5.195	-4.529
760	-8.364	0.02699	0	0.12585	-0.02065	0	0	0	0	0.8359	0	0	0	0.1583	4.960	-4.459
761	-7.745	0.03916	0	0.11543	-0.02622	0	0	0	0	0	2.300	-0.1423	0.01054	0.1291	5.203	-4.530
762	-6.945	0.03819	0	0.11643	-0.02553	0	0	0	0	0	2.233	-0.1448	0	0.1335	5.168	-4.506
763	-9.832	0.03362	0	0.13548	-0.01696	0	0	0	0	0	1.926	0	0.01500	0.1437	5.090	-4.377
764	-8.693	0.03188	0	0.13658	-0.01542	0	0	0	0	0	1.830	0	0	0.1438	4.925	-4.341
765	-7.609	0.03833	0	0.11436	-0.02608	0	0	0	0	0	0	-0.1351	0.00979	0.1275	4.866	-4.406
766	-6.871	0.03756	0	0.11520	-0.02533	0	0	0	0	0	0	-0.1381	0	0.1347	4.737	-4.424
767	-9.651	0.03276	0	0.13474	-0.01759	0	0	0	0	0	0	0	0.01447	0.1462	4.933	-4.315

768	-8.562	0.03118	0	0.13571	-0.01596	0	0	0	0	0	0	0	0	0	0	0	0.1460	4.804	-4.271
769	-8.773	0.04430	0	0.08838	0	1.262	0.3804	-0.0998	0.0443	0.4412	2.458	-0.1414	0.01410	0.1273	5.819	-5.040			
770	-7.673	0.04293	0	0.09077	0	1.210	0.3147	-0.0584	0.0596	0.4257	2.359	-0.1438	0	0.1347	5.420	-4.854			
771	-10.513	0.03707	0	0.10836	0	0.994	0.2591	-0.0153	0.1260	0.6334	2.014	0	0.01833	0.1341	5.681	-4.840			
772	-9.081	0.03479	0	0.11198	0	0.910	0.1579	0.0372	0.1436	0.6186	1.894	0	0	0.1486	5.262	-4.739			
773	-8.622	0.04320	0	0.08717	0	1.207	0.3616	-0.1383	0.0332	0.4873	0	-0.1318	0.01322	0.1347	5.496	-4.926			
774	-7.598	0.04214	0	0.08951	0	1.162	0.3002	-0.0994	0.0475	0.4681	0	-0.1354	0	0.1407	5.135	-4.703			
775	-10.330	0.03618	0	0.10700	0	0.959	0.2582	-0.0524	0.1142	0.6650	0	0	0.01776	0.1344	5.554	-4.771			
776	-8.954	0.03410	0	0.11061	0	0.880	0.1592	0	0.1317	0.6468	0	0	0	0.1485	5.121	-4.680			
777	-8.747	0.04578	0	0.09390	0	1.348	0.4587	-0.1069	0.0642	0	2.531	-0.1485	0.01390	0.1305	5.668	-4.894			
778	-7.666	0.04449	0	0.09593	0	1.295	0.3920	-0.0648	0.0785	0	2.423	-0.1505	0	0.1283	5.386	-4.795			
779	-10.588	0.03889	0	0.11773	0	1.117	0.3558	-0.0190	0.1544	0	2.101	0	0.01807	0.1271	5.514	-4.662			
780	-9.180	0.03679	0	0.12092	0	1.032	0.2567	0.0344	0.1700	0	1.971	0	0	0.1469	5.194	-4.623			
781	-8.577	0.04480	0	0.09315	0	1.301	0.4463	-0.1461	0.0551	0	0	-0.1397	0.01292	0.1303	5.290	-4.754			
782	-7.581	0.04382	0	0.09507	0	1.254	0.3836	-0.1068	0.0681	0	0	-0.1428	0	0.1312	5.143	-4.692			
783	-10.390	0.03800	0	0.11673	0	1.086	0.3590	-0.0569	0.1435	0	0	0	0.01743	0.1256	5.307	-4.569			
784	-9.047	0.03613	0	0.11985	0	1.006	0.2616	-0.0037	0.1588	0	0	0	0	0.1476	5.021	-4.540			
785	-8.831	0.04365	0	0.09149	0	1.203	0.4021	-0.0470	0	0.4674	2.403	-0.1297	0.01254	0.1315	5.713	-4.994			
786	-7.830	0.04233	0	0.09345	0	1.164	0.3454	-0.0213	0	0.4534	2.321	-0.1327	0	0.1478	5.396	-4.802			
787	-10.446	0.03572	0	0.11175	0	0.943	0.2965	0.0286	0	0.6565	1.983	0	0.01704	0.1401	5.626	-4.831			
788	-9.083	0.03339	0	0.11484	0	0.877	0.2024	0.0609	0	0.6419	1.869	0	0	0.1530	5.269	-4.725			
789	-8.694	0.04266	0	0.09036	0	1.154	0.3839	-0.0874	0	0.5097	0	-0.1209	0.01173	0.1349	5.466	-4.895			
790	-7.765	0.04162	0	0.09229	0	1.120	0.3309	-0.0632	0	0.4926	0	-0.1248	0	0.1490	5.184	-4.734			
791	-10.278	0.03498	0	0.11042	0	0.911	0.2941	-0.0090	0	0.6851	0	0	0.01649	0.1418	5.470	-4.771			
792	-8.971	0.03283	0	0.11353	0	0.849	0.2025	0.0237	0	0.6675	0	0	0	0.1543	5.155	-4.667			
793	-8.782	0.04505	0	0.09732	0	1.290	0.4854	-0.0495	0	0	2.478	-0.1371	0.01232	0.1329	5.564	-4.820			
794	-7.803	0.04381	0	0.09895	0	1.250	0.4276	-0.0230	0	0	2.388	-0.1397	0	0.1387	5.389	-4.770			
795	-10.495	0.03735	0	0.12153	0	1.063	0.3969	0.0309	0	0	2.070	0	0.01676	0.1321	5.432	-4.649			
796	-9.161	0.03522	0	0.12421	0	0.998	0.3044	0.0644	0	0	1.946	0	0	0.1529	5.167	-4.574			
797	-8.626	0.04416	0	0.09662	0	1.247	0.4728	-0.0901	0	0	0	-0.1291	0.01141	0.1339	5.277	-4.730			
798	-7.727	0.04320	0	0.09817	0	1.212	0.4186	-0.0652	0	0	0	-0.1324	0	0.1391	5.102	-4.677			

799	-10.313	0.03659	0	0.12054	0	1.034	0.3980	-0.0072	0	0	0	0	0.01613	0.1348	5.233	-4.568
800	-9.042	0.03467	0	0.12320	0	0.973	0.3076	0.0267	0	0	0	0	0	0.1502	4.988	-4.500
801	-8.380	0.04151	0	0.08409	0	1.200	0.3282	0	0.0311	0.4852	2.413	-0.1376	0.01330	0.1347	5.543	-4.881
802	-7.360	0.04035	0	0.08670	0	1.162	0.2747	0	0.0461	0.4698	2.317	-0.1403	0	0.1376	5.256	-4.724
803	-10.172	0.03499	0	0.10485	0	0.963	0.2312	0	0.1147	0.6674	1.975	0	0.01765	0.1367	5.497	-4.716
804	-8.825	0.03299	0	0.10890	0	0.896	0.1435	0	0.1332	0.6531	1.852	0	0	0.1527	5.118	-4.630
805	-8.224	0.04037	0	0.08272	0	1.138	0.3034	0	0.0195	0.5300	0	-0.1281	0.01241	0.1360	5.295	-4.769
806	-7.277	0.03949	0	0.08523	0	1.107	0.2536	0	0.0337	0.5113	0	-0.1319	0	0.1446	5.012	-4.607
807	-9.980	0.03405	0	0.10327	0	0.919	0.2237	0	0.1025	0.6980	0	0	0.01705	0.1379	5.366	-4.651
808	-8.690	0.03224	0	0.10730	0	0.858	0.1384	0	0.1208	0.6803	0	0	0	0.1508	4.975	-4.571
809	-8.342	0.04309	0	0.09003	0	1.292	0.4131	0	0.0528	0	2.492	-0.1453	0.01306	0.1271	5.379	-4.705
810	-7.344	0.04202	0	0.09228	0	1.253	0.3588	0	0.0668	0	2.387	-0.1476	0	0.1309	5.178	-4.628
811	-10.245	0.03688	0	0.11464	0	1.091	0.3330	0	0.1443	0	2.066	0	0.01738	0.1314	5.318	-4.522
812	-8.925	0.03507	0	0.11827	0	1.024	0.2475	0	0.1606	0	1.933	0	0	0.1491	5.025	-4.497
813	-8.165	0.04207	0	0.08907	0	1.237	0.3942	0	0.0433	0	0	-0.1367	0.01207	0.1314	5.068	-4.572
814	-7.250	0.04128	0	0.09118	0	1.204	0.3434	0	0.0560	0	0	-0.1399	0	0.1319	4.980	-4.524
815	-10.036	0.03593	0	0.11338	0	1.050	0.3293	0	0.1331	0	0	0	0.01670	0.1307	5.112	-4.430
816	-8.781	0.03434	0	0.11693	0	0.988	0.2458	0	0.1491	0	0	0	0	0.1511	4.853	-4.414
817	-8.475	0.04116	0	0.08759	0	1.158	0.3603	0	0	0.5068	2.355	-0.1265	0.01184	0.1363	5.515	-4.849
818	-7.543	0.04001	0	0.08971	0	1.128	0.3123	0	0	0.4935	2.275	-0.1296	0	0.1510	5.225	-4.680
819	-10.142	0.03391	0	0.10865	0	0.924	0.2771	0	0	0.6880	1.938	0	0.01642	0.1387	5.475	-4.726
820	-8.854	0.03181	0	0.11206	0	0.869	0.1930	0	0	0.6745	1.824	0	0	0.1541	5.130	-4.623
821	-8.331	0.04012	0	0.08623	0	1.101	0.3355	0	0	0.5476	0	-0.1178	0.01103	0.1379	5.265	-4.751
822	-7.467	0.03921	0	0.08828	0	1.076	0.2908	0	0	0.5314	0	-0.1217	0	0.1523	4.988	-4.612
823	-9.963	0.03312	0	0.10704	0	0.884	0.2678	0	0	0.7154	0	0	0.01585	0.1418	5.332	-4.665
824	-8.731	0.03119	0	0.11047	0	0.834	0.1864	0	0	0.6990	0	0	0	0.1526	5.021	-4.566
825	-8.418	0.04266	0	0.09385	0	1.251	0.4505	0	0	0	2.434	-0.1345	0.01159	0.1349	5.348	-4.654
826	-7.510	0.04160	0	0.09565	0	1.220	0.4017	0	0	0	2.347	-0.1372	0	0.1401	5.193	-4.618
827	-10.192	0.03562	0	0.11888	0	1.051	0.3834	0	0	0	2.027	0	0.01614	0.1350	5.272	-4.523
828	-8.935	0.03373	0	0.12191	0	0.996	0.3012	0	0	0	1.904	0	0	0.1542	5.007	-4.457
829	-8.252	0.04172	0	0.09287	0	1.200	0.4308	0	0	0	0	-0.1266	0.01069	0.1370	5.051	-4.565

830	-7.422	0.04090	0	0.09456	0	1.174	0.3853	0	0	0	0	-0.1299	0	0.1427	4.902	-4.524
831	-9.998	0.03480	0	0.11759	0	1.013	0.3774	0	0	0	0	0	0.01549	0.1382	5.049	-4.435
832	-8.803	0.03310	0	0.12057	0	0.963	0.2975	0	0	0	0	0	0	0.1553	4.843	-4.382
833	-8.677	0.04517	0	0.08856	0	1.206	0	-0.0058	0.0545	0.5393	2.407	-0.1347	0.01303	0.1311	5.548	-4.917
834	-7.662	0.04374	0	0.09077	0	1.165	0	0.0170	0.0657	0.5102	2.322	-0.1381	0	0.1369	5.359	-4.710
835	-10.409	0.03793	0	0.10840	0	0.959	0	0.0455	0.1314	0.6899	2.002	0	0.01744	0.1388	5.651	-4.790
836	-9.058	0.03539	0	0.11184	0	0.889	0	0.0734	0.1455	0.6558	1.892	0	0	0.1476	5.294	-4.704
837	-8.531	0.04413	0	0.08735	0	1.156	0	-0.0491	0.0422	0.5789	0	-0.1263	0.01221	0.1378	5.327	-4.814
838	-7.586	0.04296	0	0.08951	0	1.121	0	-0.0276	0.0529	0.5476	0	-0.1305	0	0.1404	5.079	-4.644
839	-10.226	0.03706	0	0.10703	0	0.924	0	0.0079	0.1193	0.7207	0	0	0.01687	0.1369	5.490	-4.726
840	-8.931	0.03472	0	0.11046	0	0.859	0	0.0364	0.1335	0.6838	0	0	0	0.1487	5.113	-4.645
841	-8.641	0.04734	0	0.09608	0	1.303	0	0.0112	0.0824	0	2.481	-0.1418	0.01250	0.1300	5.303	-4.681
842	-7.667	0.04599	0	0.09760	0	1.258	0	0.0329	0.0913	0	2.386	-0.1446	0	0.1275	5.319	-4.637
843	-10.471	0.04037	0	0.11932	0	1.083	0	0.0675	0.1652	0	2.092	0	0.01683	0.1249	5.392	-4.543
844	-9.163	0.03802	0	0.12183	0	1.010	0	0.0955	0.1757	0	1.973	0	0	0.1473	5.142	-4.539
845	-8.472	0.04644	0	0.09523	0	1.258	0	-0.0316	0.0718	0	0	-0.1343	0.01156	0.1289	5.040	-4.585
846	-7.580	0.04535	0	0.09668	0	1.219	0	-0.0113	0.0799	0	0	-0.1377	0	0.1334	4.965	-4.520
847	-10.272	0.03953	0	0.11831	0	1.052	0	0.0300	0.1539	0	0	0	0.01616	0.1295	5.176	-4.458
848	-9.028	0.03740	0	0.12075	0	0.983	0	0.0583	0.1644	0	0	0	0	0.1435	4.946	-4.455
849	-8.722	0.04457	0	0.09170	0	1.145	0	0.0500	0	0.5712	2.352	-0.1234	0.01143	0.1375	5.504	-4.867
850	-7.813	0.04325	0	0.09349	0	1.115	0	0.0600	0	0.5457	2.281	-0.1270	0	0.1421	5.361	-4.716
851	-10.327	0.03674	0	0.11182	0	0.903	0	0.0968	0	0.7210	1.967	0	0.01603	0.1394	5.693	-4.789
852	-9.057	0.03421	0	0.11471	0	0.850	0	0.1068	0	0.6890	1.865	0	0	0.1528	5.263	-4.686
853	-8.590	0.04364	0	0.09056	0	1.100	0	0.0049	0	0.6070	0	-0.1157	0.01068	0.1367	5.263	-4.778
854	-7.747	0.04255	0	0.09231	0	1.074	0	0.0147	0	0.5797	0	-0.1199	0	0.1491	5.136	-4.659
855	-10.161	0.03602	0	0.11050	0	0.872	0	0.0584	0	0.7484	0	0	0.01548	0.1427	5.407	-4.725
856	-8.945	0.03367	0	0.11339	0	0.823	0	0.0696	0	0.7142	0	0	0	0.1532	5.124	-4.628
857	-8.659	0.04667	0	0.09969	0	1.242	0	0.0740	0	0	2.427	-0.1309	0.01086	0.1385	5.335	-4.679
858	-7.797	0.04545	0	0.10086	0	1.209	0	0.0835	0	0	2.348	-0.1340	0	0.1300	5.272	-4.616
859	-10.365	0.03906	0	0.12337	0	1.026	0	0.1264	0	0	2.057	0	0.01537	0.1341	5.405	-4.518
860	-9.147	0.03676	0	0.12539	0	0.970	0	0.1368	0	0	1.947	0	0	0.1455	5.082	-4.483

861	-8.505	0.04586	0	0.09889	0	1.201	0	0.0298	0	0	0	-0.1240	0.00999	0.1365	5.048	-4.600
862	-7.719	0.04487	0	0.10001	0	1.173	0	0.0388	0	0	0	-0.1275	0	0.1360	5.025	-4.531
863	-10.183	0.03834	0	0.12238	0	0.997	0	0.0882	0	0	0	0	0.01473	0.1364	5.122	-4.442
864	-9.027	0.03624	0	0.12437	0	0.945	0	0.0997	0	0	0	0	0	0.1499	4.898	-4.407
865	-8.343	0.04266	0	0.08495	0	1.173	0	0	0.0423	0.5733	2.357	-0.1322	0.01245	0.1332	5.387	-4.783
866	-7.384	0.04139	0	0.08730	0	1.140	0	0	0.0534	0.5463	2.274	-0.1355	0	0.1395	5.221	-4.613
867	-10.111	0.03600	0	0.10540	0	0.946	0	0	0.1213	0.7201	1.954	0	0.01691	0.1371	5.495	-4.690
868	-8.822	0.03369	0	0.10910	0	0.886	0	0	0.1360	0.6883	1.844	0	0	0.1503	5.122	-4.602
869	-8.190	0.04153	0	0.08352	0	1.115	0	0	0.0294	0.6099	0	-0.1239	0.01163	0.1374	5.123	-4.684
870	-7.299	0.04050	0	0.08579	0	1.087	0	0	0.0401	0.5808	0	-0.1279	0	0.1450	4.891	-4.511
871	-9.922	0.03507	0	0.10380	0	0.903	0	0	0.1086	0.7485	0	0	0.01633	0.1376	5.329	-4.628
872	-8.688	0.03294	0	0.10748	0	0.848	0	0	0.1235	0.7139	0	0	0	0.1520	4.974	-4.545
873	-8.310	0.04504	0	0.09306	0	1.279	0	0	0.0722	0	2.432	-0.1398	0.01191	0.1298	5.087	-4.529
874	-7.395	0.04386	0	0.09475	0	1.242	0	0	0.0812	0	2.339	-0.1426	0	0.1320	5.164	-4.517
875	-10.186	0.03865	0	0.11702	0	1.081	0	0	0.1569	0	2.043	0	0.01629	0.1293	5.236	-4.428
876	-8.941	0.03654	0	0.11981	0	1.017	0	0	0.1680	0	1.925	0	0	0.1463	4.947	-4.422
877	-8.133	0.04404	0	0.09193	0	1.226	0	0	0.0610	0	0	-0.1324	0.01096	0.1305	4.820	-4.433
878	-7.296	0.04309	0	0.09351	0	1.195	0	0	0.0692	0	0	-0.1357	0	0.1363	4.797	-4.419
879	-9.979	0.03772	0	0.11571	0	1.041	0	0	0.1451	0	0	0	0.01562	0.1312	5.005	-4.339
880	-8.798	0.03582	0	0.11843	0	0.982	0	0	0.1562	0	0	0	0	0.1467	4.794	-4.340
881	-8.426	0.04239	0	0.08864	0	1.127	0	0	0	0.6050	2.294	-0.1210	0.01089	0.1396	5.318	-4.742
882	-7.568	0.04118	0	0.09049	0	1.101	0	0	0	0.5814	2.226	-0.1245	0	0.1445	5.196	-4.596
883	-10.068	0.03515	0	0.10943	0	0.903	0	0	0	0.7518	1.910	0	0.01550	0.1422	5.509	-4.688
884	-8.854	0.03280	0	0.11243	0	0.854	0	0	0	0.7219	1.811	0	0	0.1526	5.093	-4.589
885	-8.285	0.04137	0	0.08720	0	1.074	0	0	0	0.6373	0	-0.1135	0.01015	0.1408	5.086	-4.657
886	-7.490	0.04037	0	0.08900	0	1.052	0	0	0	0.6119	0	-0.1175	0	0.1527	4.963	-4.539
887	-9.894	0.03434	0	0.10781	0	0.865	0	0	0	0.7764	0	0	0.01496	0.1458	5.296	-4.626
888	-8.732	0.03215	0	0.11082	0	0.820	0	0	0	0.7443	0	0	0	0.1573	5.008	-4.533
889	-8.371	0.04474	0	0.09736	0	1.234	0	0	0	0	2.368	-0.1291	0.01030	0.1411	5.114	-4.538
890	-7.561	0.04364	0	0.09861	0	1.206	0	0	0	0	2.293	-0.1320	0	0.1298	5.058	-4.481
891	-10.124	0.03769	0	0.12184	0	1.037	0	0	0	0	1.996	0	0.01484	0.1415	5.206	-4.412

892	-8.963	0.03558	0	0.12399	0	0.986	0	0	0	0	0	1.890	0	0	0.1514	4.884	-4.371
893	-8.207	0.04382	0	0.09619	0	1.186	0	0	0	0	0	0	-0.1223	0.00945	0.1374	4.847	-4.461
894	-7.470	0.04293	0	0.09737	0	1.162	0	0	0	0	0	0	-0.1256	0	0.1387	4.822	-4.397
895	-9.933	0.03688	0	0.12049	0	1.000	0	0	0	0	0	0	0	0.01421	0.1401	5.000	-4.329
896	-8.832	0.03496	0	0.12261	0	0.953	0	0	0	0	0	0	0	0	0.1548	4.778	-4.298
897	-8.647	0.04266	0	0.08824	0	0	0.3544	-0.0466	0.0369	0.4857	2.403	-0.1374	0.01370	0.1320	5.635	-4.953	
898	-7.592	0.04142	0	0.09069	0	0	0.2902	-0.0081	0.0531	0.4702	2.311	-0.1396	0	0.1394	5.314	-4.767	
899	-10.408	0.03611	0	0.10824	0	0	0.2420	0.0263	0.1197	0.6648	1.984	0	0.01792	0.1336	5.674	-4.796	
900	-9.020	0.03402	0	0.11182	0	0	0.1432	0.0735	0.1388	0.6482	1.870	0	0	0.1476	5.243	-4.707	
901	-8.510	0.04167	0	0.08711	0	0	0.3375	-0.0866	0.0263	0.5292	0	-0.1282	0.01287	0.1377	5.284	-4.847	
902	-7.525	0.04071	0	0.08949	0	0	0.2773	-0.0503	0.0416	0.5101	0	-0.1315	0	0.1433	4.985	-4.653	
903	-10.233	0.03528	0	0.10690	0	0	0.2419	-0.0121	0.1083	0.6946	0	0	0.01738	0.1370	5.517	-4.735	
904	-8.897	0.03338	0	0.11048	0	0	0.1452	0.0354	0.1271	0.6748	0	0	0	0.1497	5.127	-4.650	
905	-8.604	0.04412	0	0.09436	0	0	0.4398	-0.0517	0.0579	0	2.481	-0.1453	0.01347	0.1273	5.481	-4.787	
906	-7.572	0.04298	0	0.09644	0	0	0.3745	-0.0125	0.0732	0	2.379	-0.1470	0	0.1308	5.277	-4.703	
907	-10.472	0.03786	0	0.11815	0	0	0.3425	0.0269	0.1487	0	2.072	0	0.01761	0.1279	5.495	-4.601	
908	-9.114	0.03598	0	0.12127	0	0	0.2457	0.0750	0.1658	0	1.948	0	0	0.1437	5.142	-4.574	
909	-8.446	0.04324	0	0.09365	0	0	0.4285	-0.0921	0.0492	0	0	-0.1369	0.01253	0.1305	5.106	-4.645	
910	-7.493	0.04238	0	0.09561	0	0	0.3672	-0.0554	0.0632	0	0	-0.1396	0	0.1338	4.901	-4.606	
911	-10.282	0.03702	0	0.11716	0	0	0.3460	-0.0121	0.1381	0	0	0	0.01699	0.1272	5.251	-4.512	
912	-8.984	0.03535	0	0.12020	0	0	0.2509	0.0360	0.1548	0	0	0	0	0.1458	4.973	-4.495	
913	-8.721	0.04216	0	0.09136	0	0	0.3776	-0.0014	0	0.5076	2.354	-0.1262	0.01221	0.1348	5.596	-4.918	
914	-7.754	0.04093	0	0.09336	0	0	0.3222	0.0221	0	0.4938	2.276	-0.1290	0	0.1503	5.313	-4.761	
915	-10.354	0.03486	0	0.11159	0	0	0.2809	0.0627	0	0.6842	1.956	0	0.01672	0.1420	5.589	-4.802	
916	-9.025	0.03267	0	0.11466	0	0	0.1886	0.0914	0	0.6686	1.847	0	0	0.1564	5.242	-4.692	
917	-8.594	0.04127	0	0.09028	0	0	0.3612	-0.0431	0	0.5477	0	-0.1177	0.01144	0.1368	5.269	-4.825	
918	-7.695	0.04030	0	0.09224	0	0	0.3092	-0.0208	0	0.5309	0	-0.1214	0	0.1514	5.086	-4.697	
919	-10.192	0.03417	0	0.11028	0	0	0.2792	0.0243	0	0.7114	0	0	0.01618	0.1430	5.359	-4.744	
920	-8.917	0.03216	0	0.11337	0	0	0.1893	0.0536	0	0.6929	0	0	0	0.1547	5.128	-4.638	
921	-8.656	0.04352	0	0.09776	0	0	0.4673	-0.0015	0	0	2.432	-0.1343	0.01196	0.1338	5.404	-4.729	
922	-7.714	0.04239	0	0.09943	0	0	0.4109	0.0229	0	0	2.346	-0.1367	0	0.1427	5.260	-4.687	

923	-10.393	0.03640	0	0.12187	0	0	0.3847	0.0690	0	0	2.043	0	0.01640	0.1329	5.371	-4.596
924	-9.098	0.03444	0	0.12451	0	0	0.2939	0.0987	0	0	1.925	0	0	0.1542	5.107	-4.525
925	-8.509	0.04271	0	0.09708	0	0	0.4558	-0.0431	0	0	0	-0.1265	0.01109	0.1358	5.126	-4.647
926	-7.644	0.04184	0	0.09866	0	0	0.4028	-0.0201	0	0	0	-0.1296	0	0.1388	4.942	-4.598
927	-10.217	0.03569	0	0.12089	0	0	0.3862	0.0301	0	0	0	0	0.01579	0.1374	5.063	-4.510
928	-8.983	0.03392	0	0.12350	0	0	0.2975	0.0604	0	0	0	0	0	0.1535	4.891	-4.454
929	-8.294	0.04018	0	0.08444	0	0	0.3146	0	0.0250	0.5265	2.355	-0.1341	0.01300	0.1358	5.439	-4.808
930	-7.308	0.03912	0	0.08708	0	0	0.2611	0	0.0409	0.5114	2.264	-0.1366	0	0.1433	5.164	-4.675
931	-10.096	0.03421	0	0.10511	0	0	0.2227	0	0.1095	0.6974	1.939	0	0.01732	0.1394	5.488	-4.687
932	-8.784	0.03237	0	0.10909	0	0	0.1358	0	0.1292	0.6818	1.823	0	0	0.1507	5.114	-4.603
933	-8.152	0.03915	0	0.08314	0	0	0.2913	0	0.0141	0.5686	0	-0.1250	0.01216	0.1393	5.060	-4.705
934	-7.233	0.03834	0	0.08567	0	0	0.2415	0	0.0291	0.5502	0	-0.1284	0	0.1462	4.839	-4.536
935	-9.912	0.03334	0	0.10355	0	0	0.2158	0	0.0978	0.7260	0	0	0.01675	0.1392	5.339	-4.626
936	-8.653	0.03167	0	0.10751	0	0	0.1313	0	0.1172	0.7072	0	0	0	0.1470	4.978	-4.547
937	-8.242	0.04174	0	0.09098	0	0	0.4064	0	0.0476	0	2.438	-0.1427	0.01274	0.1294	5.262	-4.618
938	-7.281	0.04079	0	0.09326	0	0	0.3523	0	0.0625	0	2.337	-0.1446	0	0.1334	5.058	-4.548
939	-10.162	0.03604	0	0.11548	0	0	0.3289	0	0.1396	0	2.030	0	0.01701	0.1297	5.283	-4.470
940	-8.880	0.03441	0	0.11901	0	0	0.2442	0	0.1572	0	1.903	0	0	0.1476	4.990	-4.455
941	-8.078	0.04082	0	0.09005	0	0	0.3884	0	0.0386	0	0	-0.1343	0.01179	0.1321	4.859	-4.480
942	-7.194	0.04011	0	0.09218	0	0	0.3378	0	0.0522	0	0	-0.1371	0	0.1327	4.745	-4.452
943	-9.962	0.03515	0	0.11422	0	0	0.3254	0	0.1287	0	0	0	0.01636	0.1300	5.059	-4.382
944	-8.741	0.03372	0	0.11767	0	0	0.2427	0	0.1460	0	0	0	0	0.1486	4.797	-4.375
945	-8.397	0.03993	0	0.08790	0	0	0.3465	0	0	0.5451	2.301	-0.1233	0.01157	0.1380	5.391	-4.784
946	-7.494	0.03884	0	0.09005	0	0	0.2988	0	0	0.5322	2.226	-0.1262	0	0.1504	5.154	-4.648
947	-10.072	0.03319	0	0.10885	0	0	0.2686	0	0	0.7151	1.906	0	0.01614	0.1419	5.457	-4.704
948	-8.814	0.03122	0	0.11221	0	0	0.1852	0	0	0.7009	1.796	0	0	0.1544	5.126	-4.602
949	-8.264	0.03899	0	0.08659	0	0	0.3230	0	0	0.5835	0	-0.1149	0.01081	0.1401	5.073	-4.692
950	-7.425	0.03814	0	0.08866	0	0	0.2786	0	0	0.5678	0	-0.1186	0	0.1542	4.943	-4.583
951	-9.901	0.03246	0	0.10726	0	0	0.2599	0	0	0.7408	0	0	0.01559	0.1453	5.239	-4.647
952	-8.695	0.03064	0	0.11063	0	0	0.1792	0	0	0.7239	0	0	0	0.1553	5.000	-4.549
953	-8.326	0.04139	0	0.09474	0	0	0.4431	0	0	0	2.384	-0.1321	0.01131	0.1356	5.185	-4.576

954	-7.449	0.04041	0	0.09657	0	0	0.3949	0	0	0	2.300	-0.1345	0	0.1451	5.073	-4.544
955	-10.116	0.03482	0	0.11963	0	0	0.3790	0	0	0	1.994	0	0.01582	0.1388	5.219	-4.473
956	-8.891	0.03307	0	0.12258	0	0	0.2974	0	0	0	1.876	0	0	0.1574	4.966	-4.411
957	-8.171	0.04053	0	0.09379	0	0	0.4243	0	0	0	0	-0.1243	0.01044	0.1378	4.914	-4.495
958	-7.368	0.03978	0	0.09549	0	0	0.3793	0	0	0	0	-0.1274	0	0.1343	4.770	-4.456
959	-9.930	0.03406	0	0.11833	0	0	0.3733	0	0	0	0	0	0.01520	0.1416	4.928	-4.392
960	-8.764	0.03249	0	0.12125	0	0	0.2940	0	0	0	0	0	0	0.1585	4.750	-4.338
961	-8.571	0.04366	0	0.08845	0	0	0	0.0387	0.0478	0.5754	2.360	-0.1313	0.01269	0.1316	5.434	-4.846
962	-7.593	0.04232	0	0.09073	0	0	0	0.0595	0.0598	0.5466	2.279	-0.1344	0	0.1383	5.255	-4.650
963	-10.317	0.03700	0	0.10828	0	0	0	0.0815	0.1255	0.7165	1.974	0	0.01710	0.1336	5.628	-4.769
964	-9.003	0.03460	0	0.11172	0	0	0	0.1055	0.1407	0.6813	1.869	0	0	0.1469	5.286	-4.677
965	-8.436	0.04270	0	0.08730	0	0	0	-0.0056	0.0360	0.6130	0	-0.1231	0.01191	0.1344	5.185	-4.750
966	-7.523	0.04161	0	0.08951	0	0	0	0.0142	0.0474	0.5821	0	-0.1271	0	0.1449	5.019	-4.588
967	-10.142	0.03619	0	0.10694	0	0	0	0.0429	0.1137	0.7458	0	0	0.01655	0.1348	5.424	-4.707
968	-8.880	0.03398	0	0.11036	0	0	0	0.0677	0.1290	0.7080	0	0	0	0.1506	5.112	-4.620
969	-8.520	0.04582	0	0.09651	0	0	0	0.0589	0.0770	0	2.436	-0.1390	0.01212	0.1242	5.168	-4.591
970	-7.588	0.04458	0	0.09809	0	0	0	0.0788	0.0867	0	2.346	-0.1415	0	0.1292	5.085	-4.558
971	-10.369	0.03940	0	0.11970	0	0	0	0.1081	0.1600	0	2.065	0	0.01642	0.1269	5.364	-4.503
972	-9.104	0.03721	0	0.12218	0	0	0	0.1322	0.1717	0	1.952	0	0	0.1435	5.141	-4.497
973	-8.362	0.04500	0	0.09570	0	0	0	0.0152	0.0667	0	0	-0.1317	0.01121	0.1278	4.884	-4.510
974	-7.506	0.04400	0	0.09720	0	0	0	0.0340	0.0756	0	0	-0.1349	0	0.1350	4.885	-4.444
975	-10.177	0.03861	0	0.11870	0	0	0	0.0696	0.1490	0	0	0	0.01577	0.1289	5.129	-4.415
976	-8.973	0.03663	0	0.12110	0	0	0	0.0943	0.1606	0	0	0	0	0.1429	4.921	-4.416
977	-8.630	0.04319	0	0.09159	0	0	0	0.0873	0	0.6036	2.309	-0.1203	0.01116	0.1398	5.383	-4.805
978	-7.749	0.04193	0	0.09343	0	0	0	0.0961	0	0.5786	2.242	-0.1238	0	0.1479	5.272	-4.670
979	-10.247	0.03591	0	0.11168	0	0	0	0.1259	0	0.7444	1.943	0	0.01576	0.1381	5.629	-4.760
980	-9.005	0.03349	0	0.11456	0	0	0	0.1333	0	0.7118	1.844	0	0	0.1539	5.267	-4.658
981	-8.507	0.04234	0	0.09050	0	0	0	0.0415	0	0.6378	0	-0.1128	0.01044	0.1400	5.168	-4.722
982	-7.687	0.04130	0	0.09228	0	0	0	0.0502	0	0.6110	0	-0.1169	0	0.1554	5.042	-4.610
983	-10.087	0.03524	0	0.11037	0	0	0	0.0868	0	0.7705	0	0	0.01523	0.1430	5.371	-4.699
984	-8.897	0.03298	0	0.11326	0	0	0	0.0956	0	0.7359	0	0	0	0.1542	5.100	-4.602

985	-8.552	0.04527	0	0.10010	0	0	0	0	0.1148	0	0	2.386	-0.1284	0.01055	0.1372	5.124	-4.606
986	-7.722	0.04412	0	0.10132	0	0	0	0	0.1231	0	0	2.311	-0.1313	0	0.1349	5.149	-4.544
987	-10.275	0.03816	0	0.12368	0	0	0	0	0.1597	0	0	2.032	0	0.01505	0.1370	5.292	-4.481
988	-9.091	0.03599	0	0.12568	0	0	0	0	0.1675	0	0	1.926	0	0	0.1474	5.063	-4.438
989	-8.406	0.04453	0	0.09932	0	0	0	0	0.0699	0	0	0	-0.1217	0.00971	0.1358	4.931	-4.532
990	-7.649	0.04360	0	0.10047	0	0	0	0	0.0779	0	0	0	-0.1250	0	0.1411	4.890	-4.462
991	-10.099	0.03749	0	0.12269	0	0	0	0	0.1208	0	0	0	0	0.01442	0.1357	5.040	-4.398
992	-8.975	0.03551	0	0.12466	0	0	0	0	0.1298	0	0	0	0	0	0.1524	4.856	-4.365
993	-8.265	0.04141	0	0.08526	0	0	0	0	0	0.0368	0.6097	2.304	-0.1290	0.01217	0.1324	5.250	-4.719
994	-7.337	0.04020	0	0.08765	0	0	0	0	0	0.0487	0.5831	2.225	-0.1321	0	0.1407	5.066	-4.544
995	-10.040	0.03524	0	0.10563	0	0	0	0	0	0.1164	0.7475	1.920	0	0.01660	0.1366	5.454	-4.664
996	-8.783	0.03306	0	0.10929	0	0	0	0	0	0.1320	0.7147	1.816	0	0	0.1509	5.123	-4.578
997	-8.125	0.04037	0	0.08389	0	0	0	0	0	0.0245	0.6442	0	-0.1210	0.01139	0.1381	5.018	-4.627
998	-7.260	0.03939	0	0.08620	0	0	0	0	0	0.0359	0.6156	0	-0.1248	0	0.1462	4.854	-4.471
999	-9.859	0.03437	0	0.10406	0	0	0	0	0	0.1042	0.7741	0	0	0.01605	0.1400	5.265	-4.600
1000	-8.653	0.03235	0	0.10770	0	0	0	0	0	0.1199	0.7388	0	0	0	0.1508	4.966	-4.523
1001	-8.219	0.04379	0	0.09396	0	0	0	0	0	0.0681	0	2.381	-0.1374	0.01158	0.1224	4.971	-4.444
1002	-7.339	0.04270	0	0.09569	0	0	0	0	0	0.0777	0	2.293	-0.1398	0	0.1273	4.943	-4.444
1003	-10.108	0.03785	0	0.11784	0	0	0	0	0	0.1527	0	2.008	0	0.01592	0.1321	5.145	-4.379
1004	-8.901	0.03589	0	0.12055	0	0	0	0	0	0.1648	0	1.896	0	0	0.1436	4.938	-4.383
1005	-8.054	0.04288	0	0.09287	0	0	0	0	0	0.0573	0	0	-0.1301	0.01068	0.1299	4.687	-4.366
1006	-7.247	0.04200	0	0.09448	0	0	0	0	0	0.0661	0	0	-0.1332	0	0.1346	4.730	-4.345
1007	-9.909	0.03699	0	0.11653	0	0	0	0	0	0.1413	0	0	0	0.01528	0.1328	4.952	-4.295
1008	-8.762	0.03521	0	0.11918	0	0	0	0	0	0.1533	0	0	0	0	0.1461	4.771	-4.304
1009	-8.355	0.04122	0	0.08890	0	0	0	0	0	0	0.6384	2.245	-0.1182	0.01065	0.1391	5.242	-4.685
1010	-7.523	0.04007	0	0.09079	0	0	0	0	0	0	0.6152	2.181	-0.1215	0	0.1509	5.135	-4.569
1011	-10.004	0.03444	0	0.10959	0	0	0	0	0	0	0.7763	1.880	0	0.01524	0.1451	5.452	-4.661
1012	-8.817	0.03219	0	0.11257	0	0	0	0	0	0	0.7460	1.785	0	0	0.1581	5.067	-4.564
1013	-8.225	0.04028	0	0.08752	0	0	0	0	0	0	0.6689	0	-0.1108	0.00995	0.1392	4.979	-4.606
1014	-7.451	0.03932	0	0.08934	0	0	0	0	0	0	0.6440	0	-0.1147	0	0.1590	4.906	-4.512
1015	-9.837	0.03369	0	0.10800	0	0	0	0	0	0	0.7995	0	0	0.01473	0.1501	5.256	-4.602

1016	-8.698	0.03159	0	0.11098	0	0	0	0	0	0	0.7670	0	0	0	0.1618	4.999	-4.510
1017	-8.287	0.04355	0	0.09820	0	0	0	0	0	0	0	2.320	-0.1269	0.01003	0.1382	4.963	-4.470
1018	-7.507	0.04252	0	0.09949	0	0	0	0	0	0	0	2.249	-0.1295	0	0.1355	4.918	-4.415
1019	-10.053	0.03693	0	0.12256	0	0	0	0	0	0	0	1.965	0	0.01452	0.1437	5.102	-4.360
1020	-8.923	0.03495	0	0.12466	0	0	0	0	0	0	0	1.863	0	0	0.1533	4.848	-4.330
1021	-8.133	0.04271	0	0.09707	0	0	0	0	0	0	0	0	-0.1203	0.00920	0.1387	4.731	-4.399
1022	-7.422	0.04187	0	0.09827	0	0	0	0	0	0	0	0	-0.1233	0	0.1421	4.733	-4.335
1023	-9.870	0.03618	0	0.12121	0	0	0	0	0	0	0	0	0	0.01392	0.1412	4.926	-4.281
1024	-8.797	0.03436	0	0.12329	0	0	0	0	0	0	0	0	0	0	0.1506	4.765	-4.260

Logistic model offsets $\theta_{0,r}$ and coefficients $\theta_{age,r}$ to $\theta_{catheter\ ablation,r}$, according to Formula I are listed in columns 2 to 13. $p_{99}(J_r)-p_1(f(J_r))$, difference between 99% and 1% percentiles of logarithmic model values for training dataset; $p_1(J_r)$, 1% percentile of logarithmic model values for training dataset.

Claims

1. Method for predicting paroxysmal atrial fibrillation comprising
 - i) the step of determining at least the following parameters of a subject:
 - a) age, and
 - b) left atrium size (LA),
 - ii) deriving a test score based on the measured parameters;
 - iii) providing a threshold score; and
 - iv) comparing the test score with the threshold score, wherein a test score equal to or higher than the threshold score is predictive for the presence of paroxysmal atrial fibrillation.
2. Method according to claim 1, wherein as further parameters:
 - (a) tissue Doppler imaging velocity during atrial contraction (TDI), and/or aortic root diameter are determined; and/or
 - (b) at least one of hyperlipidemia and diabetes mellitus is determined; and/or
 - (c) at least one or any combination of two or more of catheter ablation, left ventricular end-diastolic diameter, heart rate, sleep apnea, intake of beta blocker, and smoker is/are determined.
3. Method according to any one of claim 1 or 2, wherein the test score is derived by combining the determined parameters in a logistic function.
4. Method according to any one of claims 1 to 3, wherein the formula for obtaining the logistic test score S_r is

$$S_r = \frac{1}{\exp \left(\begin{aligned} & -\theta_{0,r} - \theta_{age,r} \cdot \frac{\text{age}}{y} - \theta_{Ao,root,r} \cdot \frac{\text{Ao,root}}{\text{mm}} - \theta_{LA,r} \cdot \frac{\text{LA}}{\text{mm}} \\ & - \theta_{LV,ESD,r} \cdot \frac{\text{LV,ESD}}{\text{mm}} - \theta_{TDI,A',r} \cdot \frac{\text{TDI,A'}}{\text{cm/s}} - \theta_{HF,r} \cdot \frac{\text{HF}}{\text{1/min}} \\ & - \theta_{\text{sleep apnea},r} \cdot \text{sleep apnea} - \theta_{\text{hyperlipidemia},r} \cdot \text{hyperlipidemia} - \theta_{\text{type II diabetes},r} \cdot \text{type II diabetes} \\ & - \theta_{\text{smoker},r} \cdot \text{smoker} - \theta_{\beta \text{ blocker},r} \cdot \beta \text{ blocker} - \theta_{\text{catheter ablation},r} \cdot \text{catheter ablation} \end{aligned} \right) + 1}$$

(Formula I)

with the score variants r, the offsets $\theta_{0,r}$ and the weights

$$\vec{\theta}_r = [\theta_{age,r}; \theta_{Ao,root,r}; \theta_{LA,r}; \theta_{LV,ESD,r}; \theta_{TDI,A',r}; \theta_{HF,r}; \theta_{\text{sleep apnea},r};$$

$$\theta_{\text{hyperlipidemia},r}; \theta_{\text{type II diabetes},r}; \theta_{\text{smoker},r}; \theta_{\beta \text{ blocker},r}; \theta_{\text{catheter ablation},r}] ,$$

and wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

5 LA is the size of the left atrium of the subject,

LV, ESD is left ventricular end-systolic diameter of the subject,

TDI,A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

10 hyperlipidemia indicates whether the subject has hyperlipidemia,

type II diabetes indicates whether the subject has type II diabetes,

smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

15

5. Method according to any of claims 1 to 4, wherein the formula for obtaining the logistic test score S_2 is

$$S_2 = \frac{1}{\exp\left(8.797 - 0.12329 \cdot \frac{LA}{\text{mm}} - 0.03436 \cdot \frac{\text{age}}{y}\right) + 1}$$

20

wherein

age is the age of the subject and

LA is the size of the left atrium of the subject, and wherein the offsets and weighting coefficients can be varied by a maximum of 10%.

25

6. Method according to claim 5, wherein the probability for the presence of paroxysmal atrial fibrillation is increased when the logistic test score equals or exceeds a threshold score at a value of about 0.1506.

7. Method according to any of claims 1 to 6, wherein the formula for obtaining the logistic test score S_4 is

30

$$S_4 = \frac{1}{\exp\left(\begin{array}{l} 9.402 - 0.04363 \cdot \frac{\text{age}}{y} - 0.0802 \cdot \frac{Ao, \text{root}}{\text{mm}} \\ - 0.08260 \cdot \frac{LA}{\text{mm}} + 0.1382 \cdot \frac{TDI, A'}{\text{cm/s}} \end{array}\right) + 1}, \text{ (Formula II)}$$

wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject, and
TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject, and
wherein the offsets and weighting coefficients can be varied by a maximum of 10%.

- 5 8. Method according to claim 7, wherein the probability for the presence of paroxysmal atrial
fibrillation is increased when the logistic test score equals or exceeds a threshold score at a
value of about 0.1324.
9. Method according to claim 1 or 2, wherein the test score is derived by combining the de-
10 termined parameters in a linear function.
10. Method according to claim 1 or 2, wherein the formula for obtaining the linear test score L_r
is

$$\begin{aligned}
L_r = & \phi_{0,r} + \phi_{age,r} \cdot \frac{\text{age}}{y} + \phi_{Ao,root,r} \cdot \frac{\text{Ao, root}}{\text{mm}} + \phi_{LA,r} \cdot \frac{\text{LA}}{\text{mm}} + \phi_{LV,ESD,r} \cdot \frac{\text{LV, ESD}}{\text{mm}} + \phi_{TDL,A',r} \cdot \frac{\text{TDL, A'}}{\text{cm/s}} + \phi_{HF,r} \cdot \frac{\text{HF}}{1/\text{min}} \\
& + \phi_{\text{sleep apnea},r} \cdot \text{sleep apnea} + \phi_{\text{hyperlipidemia},r} \cdot \text{hyperlipidemia} + \phi_{\text{type II diabetes},r} \cdot \text{type II diabetes} \\
& + \phi_{\text{smoker},r} \cdot \text{smoker} + \phi_{\beta \text{ blocker},r} \cdot \beta \text{ blocker} + \phi_{\text{catheter ablation},r} \cdot \text{catheter ablation}
\end{aligned}$$

(Formula V)

with the variables r, the offsets $\phi_{0,r}$ and the weights

$$\vec{\phi}_r = \{ \phi_{age,r}; \phi_{Ao,root,r}; \phi_{LA,r}; \phi_{LV,ESD,r}; \phi_{TDL,A',r}; \phi_{HF,r}; \phi_{\text{sleep apnea},r}; \phi_{\text{hyperlipidemia},r}; \phi_{\text{type II diabetes},r}; \phi_{\text{smoker},r}; \phi_{\beta \text{ blocker},r}; \phi_{\text{catheter ablation},r} \} ,$$

and wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject,

5 LV, ESD is left ventricular end-systolic diameter of the subject,

TDI,A' is the tissue Doppler imaging velocity during atrial contraction of the subject,

HF is the heart frequency of the subject,

sleep apnea indicates whether the subject has sleep apnea,

hyperlipidemia indicates whether the subject has hyperlipidemia,

10 type II diabetes indicates whether the subject has type II diabetes,

smoker indicates whether the subject is a smoker,

β blocker indicates whether the subject is on β blockers, and

catheter ablation indicates whether the subject had a catheter ablation.

15 11. Method according to claims 1 or 2, wherein the formula for obtaining the linear test score L_2 is

$$L_2 = -95.19 + 2.587 \cdot \frac{LA}{mm} + 0.7211 \cdot \frac{age}{y}$$

wherein

age is the age of the subject,

20 LA is the size of the left atrium of the subject, and wherein the offsets and weighting coefficients can be varied by a maximum of 10%.

12. Method according to claim 11, wherein the probability for the presence of paroxysmal atrial fibrillation is increased when the linear test score equals or exceeds a threshold score at a
25 value of about 53.10.

13. Method according to claim 1 or 2, wherein the formula for obtaining the linear test score L_4 is

$$L_4 = -95.89 - 2.700 \cdot \frac{TDI, A'}{cm/s} + 1.656 \cdot \frac{LA}{mm} + 0.8746 \cdot \frac{age}{y} + 1.608 \cdot \frac{Ao, root}{mm},$$

30 (Formula VII)

wherein

age is the age of the subject,

Ao,root is the diameter of the aortic root of the subject,

LA is the size of the left atrium of the subject, and

35 TDI, A' is the tissue Doppler imaging velocity during atrial contraction of the subject, and wherein the offsets and weighting coefficients can be varied by a maximum of 10%.

14. Method according to claim 13, wherein the probability for the presence of paroxysmal atrial fibrillation is increased when the linear test score equals or exceeds a threshold score at a value of about 54.88.

5 15. System for predicting paroxysmal atrial fibrillation comprising

i) an ultrasound apparatus for determining at least the parameters tissue Doppler imaging velocity during atrial contraction, left atrium size, and aortic root diameter,

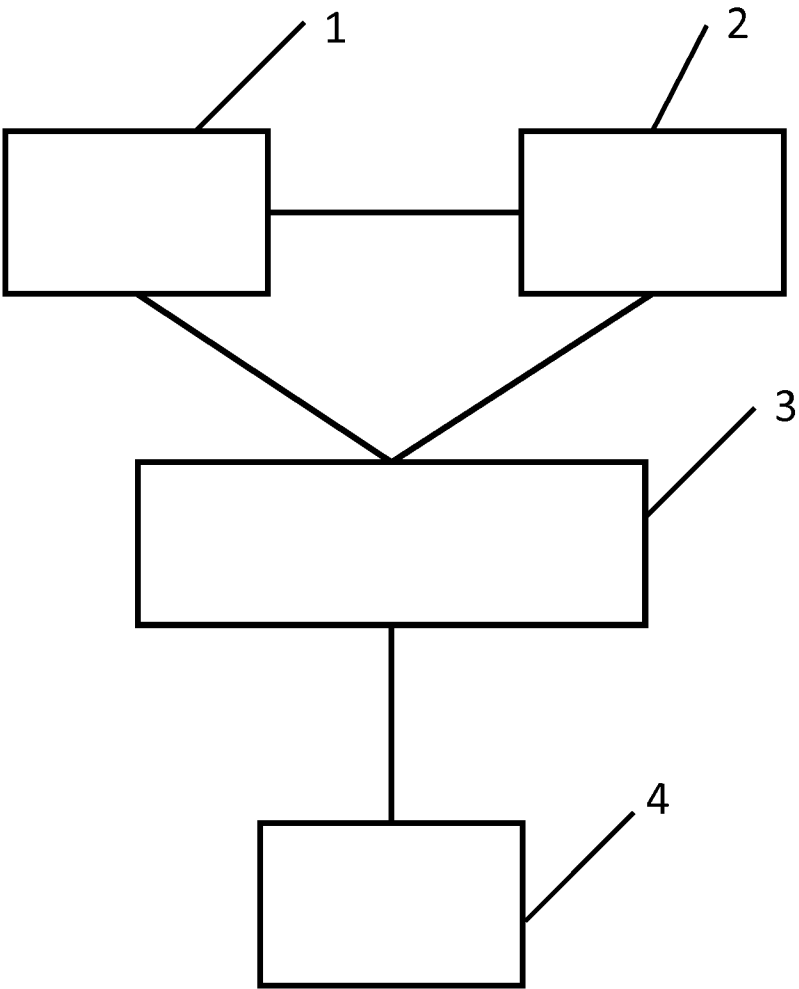
ii) an input device,

iii) an analyzing device, and

10 iv) an output device,

wherein the analyzing device is embodied for analyzing the information provided by the ultrasound apparatus and the input device and the output device is embodied for outputting the result derived from the analysis by indicating whether an increased probability for paroxysmal atrial fibrillation is present wherein the system is preferably embodied to perform
15 a method according to claims 1 to 14.

Fig. 1



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/058337

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F19/00 A61B8/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	KALLENBERGER S M ET AL: "A simple, non-invasive score to predict paroxysmal atrial fibrillation", PLOS ONE, ARTICLE 0163621, vol. 11, no. 9, 28 September 2016 (2016-09-28), pages 1-16, XP055392870, DOI: 10.1371/journal.pone.0163621 the whole document -/--	15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

31 July 2017

Date of mailing of the international search report

04/08/2017

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Domingo Vecchioni, M

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/058337

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-& Kallenberger S M et al: "S1 Text: Development of logistic models and transformation to linear scores", PLOS ONE, supplementary material to article 0163621, 28 September 2016 (2016-09-28), XP055393546, Retrieved from the Internet: URL:http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0163621.s009&type=supplementary [retrieved on 2017-07-25] the whole document -& Kallenberger S M et al: "S4 Table: Score calculator", PLOS ONE, supplementary material to article 0163621, 28 September 2016 (2016-09-28), XP055393548, Retrieved from the Internet: URL:https://doi.org/10.1371/journal.pone.0163621.s008 [retrieved on 2017-07-25] the whole document -----	
X,P	SCHMIDT C ET AL: "P6440 - Detection of atrial fibrillation using a simple non-invasive risk prediction score", EUROPEAN HEART JOURNAL, ABSTRACT P6440, vol. 37, no. 1, August 2016 (2016-08), XP055393747, the whole document	15
X,0,P	-& European Society Of Cardiology: "Poster session 7: Outcomes in atrial fibrillation", ESC Congress 2016, 27-31 August 2016, Rome, IT, 30 August 2016 (2016-08-30), XP055393743, Retrieved from the Internet: URL:http://spo.escardio.org/SessionDetails.aspx?eevtid=1127&sessId=19174&subSessId=5655 [retrieved on 2017-07-25] page 4, poster P6440 ----- -/--	15

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/058337

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Schmidt C et al: "P1715 - Detection of atrial fibrillation by a simple non-invasive risk prediction score", Abstraktband der 82. Jahrestagung der Deutschen Gesellschaft für Kardiologie-Herz- und Kreislaufforschung, 30.03.-02.04.2016, Mannheim, 26 March 2016 (2016-03-26), XP055392917, Retrieved from the Internet: URL:http://www.abstractserver.de/dgk2016/ft/abstracts//P1715.htm [retrieved on 2017-07-21] the whole document	15
L	-& ANONYMOUS: "Abstraktband der 82. Jahrestagung der Deutschen Gesellschaft für Kardiologie- Herz- und Kreislaufforschung, 30.03.-02.04.2016, Mannheim", CLINICAL RESEARCH IN CARDIOLOGY, vol. 105, no. Suppl. 1, 26 March 2016 (2016-03-26), page 1, XP035652472, ISSN: 1861-0684, DOI: 10.1007/S00392-016-0967-Z [retrieved on 2016-03-26] the whole document	
L	-& Anonymous: "Abstraktband der 82. Jahrestagung der Deutsche Gesellschaft für Kardiologie- Herz- und Kreislaufforschung vom 30. März bis 02. April 2016 in Mannheim", Clinical Research in Cardiology 105, Suppl 1, March 2016, 26 March 2016 (2016-03-26), XP055393035, Retrieved from the Internet: URL:https://rd.springer.com/article/10.1007/s00392-016-0967-z [retrieved on 2017-07-21] "First Online: 26 March 2016"	
X,0	-& Anonymous: "Postervorträge, Samstag, 2. April 2016, 10:00-11:30", 82. Jahrestagung der Deutschen Gesellschaft für Kardiologie, 30.03.-02.04.2016, Mannheim, 2 April 2016 (2016-04-02), XP055393036, Retrieved from the Internet: URL:http://dgk.org/kongress_programme/ft2016/s1086.html [retrieved on 2017-07-21] ----- -/--	15

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SUISSA L ET AL: "Score for the targeting of atrial fibrillation: a new approach to diagnosing paroxysmal atrial fibrillation", CEREBROVASCULAR DISEASES, vol. 31, no. 5, 23 February 2011 (2011-02-23), pages 442-447, XP008185238, DOI: 10.1159/000323852 [retrieved on 2011-02-23] pages 442/443; table 1 page 444/445, sections "Validation..."; figure 3	15
A	----- SUISSA L ET AL: "Score for the targeting of atrial fibrillation (STAF): a new approach to the detection of atrial fibrillation in the secondary prevention of ischemic stroke", STROKE, vol. 40, no. 8, August 2009 (2009-08), pages 2866-2868, XP009135541, ISSN: 1524-4628, DOI: 10.1161/STROKEAHA.109.552679 [retrieved on 2009-05-21] page 2867; table 1	15
A	----- HORSTMANN S ET AL: "Does the STAF score help detect paroxysmal atrial fibrillation in acute stroke patients?", EUROPEAN JOURNAL OF NEUROLOGY, vol. 20, no. 1, 12 July 2012 (2012-07-12), pages 147-152, XP55393727, GB ISSN: 1351-5101, DOI: 10.1111/j.1468-1331.2012.03816.x the whole document	15
A	----- SHUICHI F ET AL: "A simple score for predicting paroxysmal atrial fibrillation in acute ischemic stroke", JOURNAL OF NEUROLOGICAL SCIENCES, vol. 328, no. 1, 19 March 2013 (2013-03-19), pages 83-86, XP028530040, ISSN: 0022-510X, DOI: 10.1016/J.JNS.2013.02.025 sections 1, 2.3, 3, 4; tables 1, 2 ----- -/--	15

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/058337

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	YOSHIOKA K ET AL: "A score for predicting paroxysmal atrial fibrillation in acute stroke patients: iPAB score", JOURNAL OF STROKE AND CEREBROVASCULAR DISEASES, vol. 24, no. 10, October 2015 (2015-10), pages 2263-2269, XP55394119, US ISSN: 1052-3057, DOI: 10.1016/j.jstrokecerebrovasdis.2015.06.019 abstract section "Results", tables 1-3 section "Discussion" -----	15
A	HENRY W L ET AL: "Relation between echocardiographically determined left atrial size and atrial fibrillation", CIRCULATION, vol. 53, no. 2, February 1976 (1976-02), pages 273-279, XP055393021, US ISSN: 0009-7322, DOI: 10.1161/01.CIR.53.2.273 page 275, left-hand column, first paragraph -----	15
A	Hosmer D W et al: "Chapter 2 - The multiple logistic regression model" In: "Applied logistic regression", 26 February 2013 (2013-02-26), Wiley, US, XP055393444, ISBN: 978-0-470-58247-3 pages 35-47, section 2.2 -----	15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2017/058337

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1-14
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 1-14

Claims 1-14 are directed to diagnostic methods practised on the human or animal body in the sense of Rules 39.1(iv) and 67.1(iv) PCT, hence subject-matter on which no ISA or IPEA is required to carry out a search resp. to provide an opinion with regard to novelty, inventive step and industrial applicability (Article 17(2)(a)(i) and (b) resp. 34(4)(a)(i) and (b) PCT). In accordance with EPO-PCT Guidelines, G-II 4.2, the test set out in EPO Guidelines, G-II 4.2.1.3 (which is based on the EPO Enlarged Board of Appeal Opinion G 1/04) applies *mutatis mutandis*. Independent claim 1 includes method steps belonging to all four phases which are constitutive of a diagnostic method: Phase (i): "determining at least the following parameters of a subject: a) age, and b) left atrium size (LA)". The determination of the age is not a step of a technical nature. The determination of the left atrium size is a method step of a technical nature, it involves echocardiographic measurements (page 4, lines 10-20) and is thus practiced on the human or animal body (page 3, line 7: the "subject" is a human or an animal). Phase (ii) and (iii): "comparison the test score with the threshold score, wherein a test score equal to or higher than the threshold score ..." Such steps are "predominantly of a non-technical nature" within the meaning of G 1/04 (point 6.4.1) and are thus not concerned with the criterion "practised on the human or animal body". Phase (iv): "method for predicting paroxysmal atrial fibrillation" and "wherein a test score equal to or higher than the threshold score is predictive for the presence of paroxysmal atrial fibrillation". Paroxysmal atrial fibrillation is a "particular clinical picture". Phase (iv) is not concerned with the criterion "practised on the human or animal body". The other claim features ("deriving a test score based on the measured parameters", "providing a threshold score") concern additional steps not strictly belonging to any of phases (i)-(iv) and are thus irrelevant when assessing the diagnostic character of the claimed method. Hence, claim 1 is directed to a diagnostic method performed on the human or animal body in the sense of Rules 39.1(iv) and 67.1(iv) PCT. Similar considerations apply, *mutatis mutandis*, to dependent claims 2-14 .