METHOD AND SYSTEM FOR EFFICIENT DECOMPOSITION OF SINGLE-QUBIT QUANTUM GATES INTO FIBONACCI ANYON BRAID CIRCUITS

Abstract: Methods for compiling single-qubit quantum gates into braid representations for non-Abelian quasiparticles described by the Fibonacci anyon model are based on a probabilistically polynomial algorithm that, given a single-qubit unitary gate and a desired target precision, outputs a braid pattern that approximates the unitary to desired precision and has a length that is asymptotically optimal (for a circuit with such property). Single-qubit unitaries that can be implemented exactly by a Fibonacci anyon braid pattern are classified, and associated braid patterns are obtained using an iterative procedure. Target unitary gates that are not exactly representable as braid patterns are first approximated to a desired precision by a unitary that is exactly representable, then a braid pattern associated with the latter is obtained.
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(b))

(88) Date of publication of the international search report:
13 August 2015
A. CLASSIFICATION OF SUBJECT MATTER

INV. G06N99/00
ADD. B82Y10/00

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)
B82Y G06N

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, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search: 15 June 2015
Date of mailing of the international search report: 26/06/2015

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