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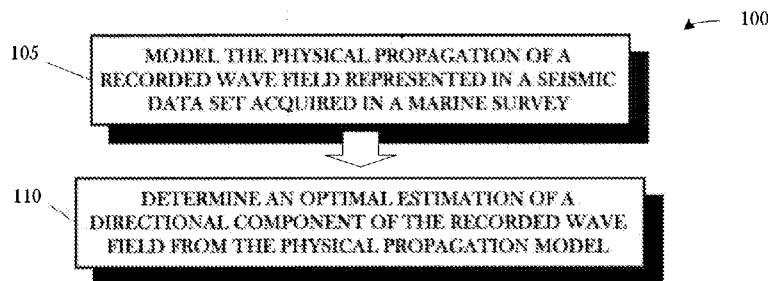


FIG. 1

(57) Abstract: A technique for decomposing a recorded wave field represented in a set of multicomponent, marine seismic data centers around a method including: estimating the statistics of the noise terms in each one of a predetermined group of seismic measurements in a seismic data set acquired in a marine survey; modeling the physical propagation of a recorded wave field represented in the seismic data set from the estimated statistics; and estimating a directional component of the recorded wave field from the physical propagation model that minimizes error relative to the seismic measurements.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G01V

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 practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/117122 A1 (CHOO JASON CHIN YEW [CA] ET AL) 17 June 2004 (2004-06-17) page 1, paragraph 0010 page 3, paragraph 0034 - page 4, paragraph 0037 page 5, paragraph 0051 claims 6, 9	1-22
X	US 3 550 073 A (FOSTER MANUS R ET AL) 22 December 1970 (1970-12-22) column 1, line 22 - line 49	3
A	US 4 935 903 A (SANDERS JOE I [US] ET AL) 19 June 1990 (1990-06-19) column 6, line 1 - line 13	1-22
A	US 4 752 916 A (LOEWENTHAL DAN [IL]) 21 June 1988 (1988-06-21) column 12, line 9 - line 55	1-22

 Further documents are listed in the continuation of Box C. See patent family annex.

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004117122	A1	17-06-2004	NONE
US 3550073	A	22-12-1970	NONE
US 4935903	A	19-06-1990	EP 0400775 A2 05-12-1990 EP 0400776 A2 05-12-1990
US 4752916	A	21-06-1988	NONE