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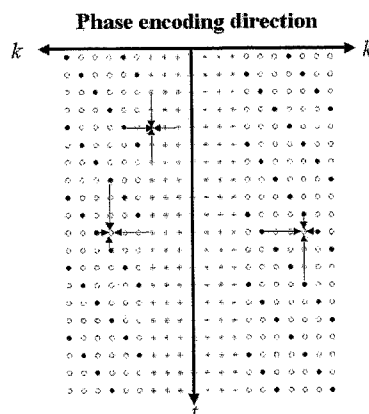
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(54) Title: **TECHNIQUE FOR PARALLEL MRI IMAGING (K-T GRAPPA)**



(57) Abstract: The subject invention relates to a method for reconstructing a dynamic image series. Embodiments of the subject invention can be considered and/or referred to as a parallel imaging-prior-information imaging (parallel-prior) hybrid method. A specific embodiment can be referred to as *k-t* GRAPPA. The subject method can involve linear interpolation of data in *k-t* space. Linear interpolation of missing data in *k-t* space can exploit the correlation of the acquired data in both *k*-space and time. Several extra auto-calibration signal (ACS) lines can be acquired in each *k*-space scan and the correlation of the acquired data can be calculated based on the extra ACS lines. In an embodiment, ACS lines can be calculated based on other acquired data, such that values in an ACS line can be partially acquired and the unacquired values can be calculated and filled in based on the acquired values. In a preferred embodiment, no extra training data is used and no sensitivity map is used. In an embodiment, the extra ACS lines can be directly applied in the *k*-space to improve the image quality. Because the correlations exploited via the subject method are local and intrinsic, the subject method does not require that the sensitivity maps have no change during the acquisition. Advantageously, the subject method can be utilized when sensitivity maps change, preferably slowly, during the acquisition of the data.



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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)

G01R

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)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FENG HUANG ET AL: "Parallel imaging with prior information for dynamic MRI" BIOMEDICAL IMAGING: MACRO TO NANO, 2004. IEEE INTERNATIONAL SYMPOSIUM ON ARLINGTON, VA, USA APRIL 15-18, 2004, PISCATAWAY, NJ, USA, 15 April 2004 (2004-04-15), pages 217-220, XP010773747 ISBN: 0-7803-8389-3 the whole document ----- -/--	1-25

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TSAO J ET AL: "k-t BLAST and k-t SENSE: dynamic MRI with high frame rate exploiting spatiotemporal correlations" MAGNETIC RESONANCE IN MEDICINE, vol. 50, November 2003 (2003-11), pages 1031-1042, XP002369276 ISSN: 0740-3194 * pages 1031 - 1036: Introduction and "Theory" *	1-25
X	F. HUANG ET AL.: "Linear Interpolation in K-space" PROCEEDINGS INTL. SOC. MAGN. RES. MED., vol. 11, April 2004 (2004-04), page 2139, XP002369547 the whole document	1-25
X	F. HUANG ET AL.: "Reconstruction with Prior Information for Dynamic MRI" PROCEEDINGS INTL. SOC. MAGN. RES. MED., vol. 11, April 2004 (2004-04), page 2680, XP002369917 the whole document	1-25
X	GRISWOLD M A ET AL: "Generalized autocalibrating partially parallel acquisitions (GRAPPA)" MAGNETIC RESONANCE IN MEDICINE WILEY USA, vol. 47, June 2002 (2002-06), pages 1202-1210, XP002369548 ISSN: 0740-3194 * pages 120 - 1205: "Theory" *	1-25
A	MADORE B: "UNFOLD-SENSE: a parallel MRI method with self-calibration and artifact suppression" MAGNETIC RESONANCE IN MEDICINE WILEY USA, vol. 52, no. 2, August 2004 (2004-08), pages 310-320, XP008060664 ISSN: 0740-3194 the whole document	1-25