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(54) **SIGNAL AMPLITUDE FEATURE-BASED METHOD FOR FAST RECONSTRUCTING A MAGNETIC PARTICLE IMAGING AND DEVICE**

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See application file for complete search history.

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(57) **ABSTRACT**

The present disclosure includes: transforming a time-domain voltage signal collected by an MPI system device to a frequency domain; calculating a square root of a square sum of a real part and an imaginary part at each frequency point of a frequency domain signal; arranging acquired amplitudes in a descending order, and acquiring a screening threshold by an amplitude ratio method; screening an amplitude through the screening threshold and constructing frequency domain signal data; acquiring a row vector of a system matrix corresponding to each frequency point of the data, so as to construct an update system matrix; and solving, based on the frequency domain signal array and the update system matrix, an inverse problem in a form of a least square based on an L2 constraint to obtain a three-dimensional magnetic particle concentration distribution result, so as to achieve a fast reconstruction of the MPI system.

8 Claims, 3 Drawing Sheets