



Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 15. April 2021, um 17:15 Uhr, - ONLINE -

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Fast image reconstruction techniques in Lissajous-type Magnetic Particle Imaging

Zusammenfassung/Abstract:

A common way to acquire system matrices in Magnetic Particle Imaging (MPI) is to measure the MPI system response in a tedious calibration scan using shifted delta probes on a fine spatial grid. In Lissajous-type Magnetic Particle Imaging, the particular topology of the scanner allows to reduce this calibration step, to compress the system matrix and to accelerate the image reconstruction. A key ingredient for this reduction is the fact that for a Lissajous scanning topology the rows of the MPI system matrix have a sparse representation in terms of tensor-product Chebyshev polynomials. In this talk, we will analyse the mathematical structure of this representation and show how it can be used for system matrix compression and to obtain direct solvers for the inversion.

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