# Newton Method for Injection Current Nonlinear Encoding(ICNE) in MREIT

Chunjae Park
Department of Mathematics, Konkuk University, Korea

Using an MRI scanner, MREIT measures the one component of induced magnetic flux density which appears in the phase part of the acquired MR data. The recently developed injected current nonlinear encoding (ICNE) method uses a new MR pulse sequence to extend the duration of the injection current until the end of a reading gradient. It maximizes signal intensity of the magnetic flux density. But, it is impossible to use a usual inverse Fourier transform to recover the magnetic flux density, since the current injection during the reading gradient disturbs linearity of the reading gradient by unknown induced magnetic flux density. In ICNE method, it is natural to use the Newton method for precise magnetic flux density reconstruction from finitely encoded MR $k$-space data. In this talk, we set up a well-conditioned Vandermonde type matrix system and investigate a radius of convergence in the Newton method. Numerical experiments show feasibility of the proposed Newton method.