

# Conductivity Image Reconstruction in Magnetic Resonance Electrical Impedance Tomography (MREIT)

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Injection current into an electrically conducting object such as the human body produces internal distributions of voltage, current density, and magnetic flux density. In magnetic resonance electrical impedance tomography (MREIT), we measure the distribution of the induced magnetic flux density inside the imaging object using an MRI scanner. Utilizing measured data of internal magnetic flux densities subject to multiple injection currents, we can reconstruct cross-sectional images of the conductivity distribution. We describe theoretical and experimental aspects of the MREIT technique to produce conductivity images with high spatial resolution. From our latest study of animal experiments, we present conductivity images of canine brains using a 3T MREIT system and 5-mA injection currents. Future research direction toward clinical applications of the technique will be discussed.