

Magnetic induction tomography modeling in biological tissue imaging using two-port network technique

Abstract

Magnetic Induction Tomography (MIT) is a non-invasive and non-intrusive imaging technique which interested in passive electrical properties of a material that are permittivity, permeability and conductivity. MIT applies sinusoidal electromagnetic field generated by excitation coil. The electromagnetic signal propagates and then penetrates the material located in the region of interest (ROI). The eddy currents are induced within the material itself due to its conductivity property. These eddy currents generate secondary fields and then are measured at the receiver by the sensors. Secondary magnetic field carries the information of the electrical properties inside the material, thus it is very important in reconstructing the image of the material through the use of image reconstruction algorithm. This paper is intended to discuss the modeling of Magnetic Induction tomography (MIT) in biological tissue imaging using two-port network technique hence developed the sensitivity maps which is vital in image reconstruction algorithm.

Keywords

Biological tissue; Magnetic induction tomography; Passive electrical properties; Sensitivity maps; Two-port network