

SPECTROSCOPIC INVERSE ADMITTIVITY PROBLEM

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ABSTRACT. Biological tissues exhibit frequency-dependent admittivity spectra. In the frequency range below 1 MHz, for example, the conductivity of a biological tissue tends to increase and its permittivity decreases with frequency. Unlike most non-biological materials, susceptibility values of biological tissues are significantly larger being comparable to their conductivity values at frequencies greater than 10 kHz. This unique property stems from the membrane of a cell, of which cluster comprises a biological tissue. Spectroscopic inverse admittivity problem(SIAP) aims to provide an admittivity spectra of a biological tissue and its physiological parameter. Finding any robust relationship between the properties of a biological tissue and practically measurable impedance data would be an important issue in biomedical research. In this work we are interested in understanding frequency response of the thin membrane by investigating a quantitative relation between the frequency changes of impedance and the thickness of membrane.