

Nondestructive inspection of biological tissue by optical tomography

Manabu Machida

Institute for Medical Photonics Research, Hamamatsu University School of Medicine, Hamamatsu, Shizuoka 431-3192, Japan

E-mail: machida@hama-med.ac.jp

Optical tomography is a medical imaging modality. It is similar to X-ray CT but uses near-infrared light instead of X-rays. Optical tomography is free from radiation exposure and can be done by rather small devices with a near-infrared laser. However, the underlying mathematics is more difficult compared with X-ray CT because near-infrared light experiences multiple scatterings in biological tissue. Optical tomography is formulated as inverse problems of determining coefficients in the radiative transport equation or the diffusion equation. In this talk, I will explain how these inverse problems are used to obtain tomographic images.