Factorization method in optical tomography

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Abstract

In optical tomography one tries to determine the spatial absorption and scattering distributions inside a body by using pairs of inward and outward fluxes of near-infrared light measured on the object boundary. In practice, the scatter and the absorption are often smooth known functions apart from inclusions where at least one of these optical parameters jumps to a higher or lower value. I will demonstrate how different kinds of optical inhomogeneities can be located by the factorization method of Andreas Kirsch if it is assumed that the measurements obey the diffusion approximation of the radiative transfer equations. The emphasis will be on purely absorbing inclusions, i.e. inhomogeneities that affect only the coefficient of the zeroth order term in the diffusion equation. Numerical examples will be presented.