Optical tomography on simple Riemannian surfaces

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Abstract

Optical tomography refers to the use of near-infrared light to determine the optical absorption and scattering properties of a medium. In the stationary Euclidean case the dynamics are modelled by the radiative transport equation, which assumes that, in the absence of interaction, particles follow straight lines. Here we shall study the problem in the presence of a Riemannian metric where particles follow the geodesic flow of the metric. In particular we study the problem in dimension two where the analysis is more delicate than in the higher dimensional cases.