

The stationary transport equation with angularly averaged measurements

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Abstract

We consider an inverse problem for the stationary linear (Boltzmann) transport equation on a bounded domain $X \subset \mathbb{R}^n$, with $n \geq 2$. In our measurement scheme we inject X with L^1 integrable flux having both positional and directional dependence. We then measure a weighted average of the outgoing flux. Taking measurements at every point on ∂X , we are able to reconstruct the absorption coefficient. Under additional assumptions (in particular a smallness assumption on the scattering) measurements made at one point are sufficient to uniquely determine the scattering coefficient. Stability estimates are then obtained.