

Spectral Properties of the Reflection Operator in Two Dimensions

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Abstract

We study spectral properties of the reflection operator (a singular integral operator arising naturally in connection with the radiosity equation which models the energy transfer between different parts of a surface by radiation) acting on L^p spaces, $p \in (1, \infty)$, on infinite angles in two dimensions. More specifically we establish an explicit characterization of the spectrum and spectral radius estimates for the reflection operator acting on L^p spaces on an infinite angle in two dimensions. This type of analysis is relevant to the solvability of the radiosity equation with L^p data since when the spectral radius is < 1 , the solution can be explicitly expressed as a convergent Neumann series.