GREEN KERNEL AND MARTIN KERNEL OF LINEAR ELLIPTIC OPERATORS WITH HARDY-TYPE POTENTIALS

Konstantinos Gkikas
Department of Mathematics, National and Kapodistrian University of Athens
kugkikas@gmail.com

Abstract

Let $\Omega \subset \mathbb{R}^N$ $(N \geq 3)$ be an open bounded domain with C^2 boundary and $K \subset \Omega$ be a compact, C^2 submanifold in $\mathbb{R}^N$ without boundary, of dimension k with $0 \leq k < N-2$. We consider the Schrödinger operator $L_\mu = \Delta + \mu d_K^{-2}$ in $\Omega \setminus K$, where $d_K(x) = \operatorname{dist}(x, K)$. The optimal Hardy constant $H = (N-k-2)/2$ is deeply involved in the study of $-L_\mu$. When $\mu \leq H^2$, we establish sharp, two-sided estimates for Green kernel and Martin kernel of $-L_\mu$. We use these estimates to prove the existence, uniqueness and a priori estimates of the solution to the boundary value problem with measures for linear equations associated with $-L_\mu$.