

Meeting on Computational and Analytic Problems in Spectral Theory

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Abstract of Talk

EFFECTIVE HAMILTONIANS FOR SPECTRAL ASYMPTOTICS OF ROBIN LAPLACIANS

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For an open set $\Omega \subset \mathbf{R}^d$ with a suitably regular boundary and a constant $\alpha > 0$, denote by Q_α^Ω the Laplacian $u \mapsto -\Delta u$ acting in $L^2(\Omega)$ on the functions u satisfying the Robin boundary conditions $D_n u = \alpha u$ on $\partial\Omega$, where D_n is the outer unit normal derivative.

On the other hand, denote by M be the sum of the principal curvatures, which is defined on $\partial\Omega$, and consider the Schrödinger operator

$$L_\alpha^\Omega := -\Delta_{\partial\Omega} - \alpha M$$

acting in $L^2(\partial\Omega)$, where $\Delta_{\partial\Omega}$ is the Laplace-Beltrami operator.

We show that in various situations there is a link between the spectral properties of Q_α^Ω and those of L_α^Ω . In particular, we discuss the eigenvalue asymptotics for $\alpha \rightarrow +\infty$ and the behavior of the discrete spectrum on conical domains.

The talk is based on joint works with Vincent Bruneau and Nicolas Popoff (Bordeaux).