

SEMINÁRIO DO GRUPO DE FÍSICA MATEMÁTICA

Dia 10 de Setembro (segunda-feira), às 14h30, sala 6.2.33

Asymptotics of Robin Eigenvalues via Dirichlet-to-Neumann Analysis

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Abstract: We study the asymptotic behaviour of the eigenvalues of the Laplace operator equipped with a complex Robin boundary condition depending on the Robin parameter (or coupling constant) $\alpha \in \mathbb{C}$. Of principal interest is the case when α diverges in the complex plane. To get intuition we first consider several model cases such as intervals, star-shaped compact quantum graphs, and n - dimensional balls. Since the Robin parameter is complex, the variational techniques used extensively to study the self-adjoint case of real α fail here. However, by characterising the eigenvalues of the Robin problem in terms of a meromorphic family of Dirichlet-to-Neumann operators depending on the spectral parameter λ , we can use properties of divergent eigenvalues α of the latter to prove some abstract results for Robin eigenvalues on Lipschitz domains and star shaped quantum graphs.

The talk is based on joint work with Sabine Bögli (Ludwig Maximilian University of Munich) and James Kennedy (University of Lisbon).