Fredholm Theory and the Resolvent of the Laplacian near Zero Energy on Asymptotically Conic Spaces

(28 February 2018)

András Vasy

Stanford University

The speaker and his collaborators consider geometric generalizations of Euclidean low energy resolvent estimates, such as estimates for the resolvent of the Euclidean Laplacian plus a decaying potential, in a Fredholm framework. More precisely, the setting is that of perturbations $P(\sigma)$ of the spectral family of the Laplacian $\Delta_g-\sigma^2$ on asymptotically conic spaces (X,g) of dimension at least 3, and the main result is uniform estimates for $P(\sigma)^{-1}$ as $\sigma\to 0$ on microlocal variable order spaces under an assumption on the nullspace of $P(0)$ on the appropriate function space (which in the Euclidean case translates to 0 not being an L^2-eigenvalue or having a half-bound state). These spaces capture the limiting absorption principle for $\sigma\neq 0$ in a lossless, in terms of decay, manner.