On eigenvalues of the fractional Laplacian under removal of small capacity sets

Veronica FELLI

Department of Materials Science, University of Milano - Bicocca, Italy, veronica.felli@unimib.it

In this talk we consider the eigenvalue problem for the restricted fractional Laplacian in a bounded domain with homogeneous Dirichlet boundary conditions. We introduce the notion of fractional capacity for compact subsets, with the property that the eigenvalues are not affected by the removal of zero fractional capacity sets. Given a simple eigenvalue, we remove from the domain a family of compact sets which are concentrating to a set of zero fractional capacity and we detect the asymptotic expansion of the eigenvalue variation; this expansion depends on the eigenfunction associated to the limit eigenvalue. The case in which the family of compact sets is concentrating to a singleton will be described in details.

Based on joint work with Laura Abatangelo and Benedetta Noris.

Keywords: Fractional Laplacian, Asymptotics of eigenvalues. Fractional capacity.