



Analysis and PDE Seminar

November 30, 2022

3:00 - 4:00 p.m.

PH 385

Stability of spectral partitions with corners

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Abstract. Given the n th eigenfunction of the Laplacian on a manifold, its zero set partitions the manifold into at most n connected components, called nodal domains. Knowing when this upper bound is achieved is an interesting and difficult problem.

This is closely related to the notion of a spectral minimal partition: it has been shown that an eigenfunction achieves this upper bound precisely when it minimizes a certain energy functional defined on the space of all partitions. More generally, for a suitably generic partition the Morse index of this functional quantifies how far the upper bound is from being realized.

After reviewing the connection between nodal domains and minimal partitions in the generic case, I will present new results for non-generic partitions, where the nodal lines are allowed to intersect. The analysis of this problem is significantly more complicated than in the generic case, on account of deformations that want to decrease the energy by changing the topology of the nodal set.