

Title: The Saint-Venant inequality and quantitative resolvent estimates for the Dirichlet Laplacian.

Abstract: Among all cylindrical beams of a given material, those with circular cross sections are the most resistant to twisting forces. The general dimensional analogue of this fact is the Saint-Venant inequality, which says that balls have the largest "torsional rigidity" among subsets of Euclidean space with a fixed volume. We discuss recent results showing that for a given set E , the gap in the Saint-Venant inequality quantitatively controls the L^2 difference between solutions of the Poisson equation on E and on the nearest ball, for any Holder continuous right-hand side. We additionally prove quantitative closeness of all eigenfunctions of the Dirichlet Laplacian. This talk is based on joint work with Mark Allen and Dennis Kriventsov.