

Local version of the Courant nodal domain theorem

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Let M be a closed n -dimensional smooth Riemannian manifold. We consider the eigenfunctions of the Laplace operator on M and estimate the number of nodal domains of k th eigenfunction that intersect a given geodesic ball. The problem of local bounds for the volume and for the number of nodal domains was raised by Donnelly and Fefferman, who also proposed an idea how one can prove such bounds. We combine their idea with two new ingredients: the recent sharp Remez type inequality for eigenfunctions and the Landis type growth lemma in narrow domains. The talk is based on a joint work with Sagun Chanillo, Alexander Logunov, and Dan Mangoubi.