

INTERSECTION BOUNDS FOR NODAL SETS OF PLANAR NEUMANN EIGENFUNCTIONS WITH INTERIOR ANALYTIC CURVES

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ABSTRACT. Let $\Omega \subset \mathbb{R}^2$ be a bounded piecewise-analytic domain and ϕ_λ be a Neumann (or Dirichlet) eigenfunction with eigenvalue λ^2 and nodal set $\mathcal{N}_{\phi_\lambda} = \{x \in \Omega; \phi_\lambda(x) = 0\}$. Let $H \subset \Omega$ be an interior C^ω curve. Consider the intersection number

$$n(\lambda, H) := \#(H \cap \mathcal{N}_{\phi_\lambda}).$$

We prove that under an appropriate “goodness” condition on H ,

$$n(\lambda, H) = \mathcal{O}_{H, \Omega}(\lambda)$$

as $\lambda \rightarrow \infty$ and give some applications of this result in the case of ergodic billiards.