

Dan Mangoubi

On the Inner Radius of Nodal Domains

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HU Berlin
Institut für Mathematik
Rudower Chaussee 25, Raum 1.410
12489 Berlin

Let M be a closed Riemannian manifold of dimension n .

Let f be an eigenfunction of the Laplacian on M with eigenvalue k .

A nodal domain is a connected component of the set $f \neq 0$.

We discuss the asymptotic geometry of nodal domains on M .

We prove that the inner radius R of a nodal domain is bounded by $C_1 / k > R > C_2 / k^{(n-1)/2}$.

In dimension two we have a sharp bound.

One ingredient of our proof is the estimation of the volume of positivity of a harmonic function u in the unit ball with $u(0)=0$, in terms of its growth.

Kontakt:

Humboldt-Universität zu Berlin . Institut für Mathematik
SFB 647 . Unter den Linden 6 . 10099 Berlin
Tel. +49 30 2093 1804 . Fax. +49 30 2093 2727
sfb647@math.hu-berlin.de