

A SCHIFFER-TYPE PROBLEM FOR ANNULAR DOMAINS

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The so-called Schiffer conjecture can be stated as follows: *If a nonconstant Neumann eigenfunction of the Laplacian on a smooth bounded domain is constant on the boundary, then the domain is a ball.* In this talk we will consider two slightly relaxed versions of this conjecture, and provide suitable counterexamples to them. Specifically, we will consider annular type domains on the plane, and spherical cap type domains on the 2-sphere. The proofs rely on a local bifurcation argument. We combine the use of anisotropic Holder spaces for the functional setting with computer-assisted techniques to check the bifurcation conditions. The talk is based on joint works with A. Enciso, D. Ruiz and P. Sicbaldi (planar case), and with G. Cao-Labora (2-sphere case).