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Spectral geometry of the Steklov problem (survey article). (English) Zbl 1378.58026
J. Spectr. Theory 7, No. 2, 321-359 (2017).

In recent years, the spectral theory of the Dirichlet-Neumann operator has caught a great deal of attention. Its spectral theory is the same as that for the Steklov problem. The paper under review is an overview of some work from the last few years. Despite recent years attention, several interesting problems remain open, for instance, revolving around the Dirichlet-Neumann operator on non-smooth boundaries (discussed in section 3 in the paper under review). Another problem discussed in the paper is the analogue of Kac's question "can the Dirichlet-Neumann operator detect the shape of a drum?", formally asked in section 5 of the paper under review. The current lack of complete solutions to these two problems can be explained by the fact that while the Dirichlet-Neumann operator is studied mainly for smooth boundaries, the isospectrality problem ("can one hear the shape of a drum?") is to date not solved in the category of smooth domains.

Reviewer: [Magnus Goffeng \(Göteborg\)](#)

MSC:

[58J50](#) Spectral problems; spectral geometry; scattering theory on manifolds
[35P15](#) Estimates of eigenvalues in context of PDEs
[35J25](#) Boundary value problems for second-order elliptic equations

Cited in **2** Reviews
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Keywords:

[Steklov eigenvalue problem](#); [Dirichlet-to-Neumann operator](#); [Riemannian manifold](#)

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