
Asymptotic behaviour of the Steklov spectrum on dumbbell domains

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In this talk we analyse the asymptotic behaviour of the eigenvalues and eigenvectors of a Steklov problem in a dumbbell domain consisting of two Lipschitz sets connected by a thin tube with vanishing width. All the eigenvalues are collapsing to zero, the speed being driven by some power of the width which multiplies the eigenvalues of a one dimensional problem. In two dimensions of the space, the behaviour is fundamentally different from the third or higher dimensions and the limit problems are of different nature. This phenomenon is due to the fact that only in dimension two the boundary of the tube has not vanishing surface measure.

This talk is based on a joint work with Dorin Bucur and Antoine Henrot [1].

References

- [1] D. Bucur, A. Henrot, and M. Michetti. Asymptotic behaviour of the Steklov spectrum on dumbbell domains. *Comm. Partial Differential Equations*, 46(2):362–393, 2021.