Eigenvalue and Resonance Asymptotics for the Dirichlet Laplacian in perturbed periodically twisted tubes

Nicolas Popoff*
Université de Bordeaux
nicolas.popoff@math.u-bordeaux.fr

Abstract
We consider the Dirichlet Laplacian in a three-dimensional waveguide that is a small deformation of a periodically twisted tube. The deformation is given by a bending and an additional twisting of the tube, both parametrized by a coupling constant. We expand the resolvent of the perturbed operator near the bottom of its essential spectrum and we show the existence of exactly one resonance, in the asymptotic regime of a small deformation. We perform the asymptotic expansion of the resonance which in particular permits us to give a quantitative geometric criterion for the existence of a discrete eigenvalue below the essential spectrum corresponding to a trapped mode. This is a joint work with Vincent Bruneau, Pablo Miranda and Daniel Parra.

*Speaker