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**Normal and Trapped modes in fluid domains with nontrivial geometries.**

Abstract:

In this talk we propose simplified long wave model for the study of linear (2-D) normal modes in straight channels with uniform cross-sections and (3-D) longitudinal and Ursell modes for some geometries for which there are exact results. The model relies on an approximate Dirichlet-Neumann operator that has been studied in previous work. We examine the accuracy of this approximation for these examples, and also we analyze the spectra of this operator with the aim to identify its discrete spectrum that is directly related with trapped modes.