Exponential stabilization for an acoustic system

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Abstract

The talk is based on a joint work with Kaïs Ammari and Fathi Hassine. Acoustic system is a linear first order system to modeled sound in a fluid in a bounded domain. The state variables are speed of fluid and pressure. We consider the localized damped equation and the fluid tangent to the boundary. Formally this system can be related with wave equation with Neumann boundary condition. The acoustic system is an evolution equation generated by an unbounded first order operator. To prove the exponential stability we prove a uniform estimate of the resolvent on imaginary axis. To do that we use semiclassical tools. There are two main steps. First we prove that the non negative semiclassical measure (which is a matrix of measures) has a particular structure and essentially depends only on a scalar measure. Second we prove propagation of support for this scalar measure.