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Scattering of acoustic waves in a bifurcated flexible channel

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This paper deals with the propagation and scattering of acoustic wave through a bifurcated flexible channel and discontinuity. The orthogonal and non-orthogonal duct modes across the interface are matched via the continuity of pressure and normal velocities. It enables to determine the amplitudes of scattering duct modes. However, there appear some oscillations in normal velocities that can be removed by using the Lanczos filters to extract the required useful information. Further, the accuracy of algebra can be seen through the conserve power identity that also insights the problem physically. Analytic analysis shows that the fundamental duct mode incident, which contains the characteristics of rigidly bounded duct, is scattered through the bifurcation of flexible channel and the discontinuity of structure.

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Simulation of quantum stochastic differential equation

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The Hudson-Parthasarathy noisy Schrödinger equation is an infinite dimensional differential equation where the noise operators — Creation, Annihilation and Conservation processes take values in Boson Fock Space. We choose a finite truncated basis of exponential vectors for the Boson Fock Space and simulate the unitary evolution in a truncated orthonormal basis obtained by applying the Gram-Schmidt ortho-normalization process to the exponential vectors. We then use this simulate for the approximate evolution of the system state by tracing out over the bath space. This simulation is compared to the exact Sudarshan Lindblad equation for the system state.

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