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Multi-channel square well scattering model for chaotic collisions

NIRAV MEHTA, Trinity University, CHRISTOPHER TICKNOR, Theoretical Division, Los Alamos National Laboratory, KADEN HAZZARD, Rice University — A simple many-channel model that consists of square-well channel potentials with constant couplings inside the well is presented. The number of channels, potential depths, channel couplings and threshold splittings are all tunable parameters, affording enough flexibility to reproduce essential features of chaotic scattering in a simple, semi-analytical model. For scattering with one open channel, the position, width and Fano q parameter are extracted for each resonance. The Brody parameter, which characterizes the distribution of energy level spacings and the degree of chaos is calculated. Its behavior as a function of various model parameters is studied. Finally, the effect of an open channel resonance on the background of dense Feshbach resonances is studied.

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