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Ultracold Three-body Elastic Scattering in the Adiabatic Hyperspherical Representation[1] VICTOR COLUSSI, JOSE D'INCAO, JILA, NIST and Department of Physics, University of Colorado, Boulder, Colorado, CHRIS GREENE, Department of Physics and Astronomy, Purdue University, West Lafayette, Indiana , MURRAY HOLLAND, JILA, NIST and Department of Physics, University of Colorado, Boulder, Colorado — In the past few years, advances in ultracold quantum gases together with the ability to control interatomic interactions have opened up important questions related to three-body contributions to collective phenomena observables. In order to theoretically understand such contributions one needs to explore the three-body elastic scattering problem, which is fundamentally different than its two-body counterpart. The main difficulty is in the necessity to determine contributions to three-body scattering that originate from multiple scattering events where two atoms interact while the third spectates [1]. These contributions must be subtracted out in order to determine scattering events that are truly of a three-body nature, i.e., collision events in which all three atoms participate. Here, we study this problem in the adiabatic hyperspherical representation and identify how unwanted two-body scattering events manifest in this picture. This opens up ways to develop a simple procedure capable of extracting truly three-body contributions to elastic scattering. [1] R. D. Amado and M. H. Rubin, Phys. Rev. 25, 194 (1970).

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