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High Partial Wave Multichannel Quantum Defect Theory for Cold Collisions[1] BRANDON RUZIC, JILA - University of Colorado at Boulder, JOHN BOHN, CHRIS GREENE, JILA — We introduce a formulation of multichannel quantum defect theory which is numerically stable for high partial waves at ultracold energies and use this formulation to study Fano-Feshbach resonances in alkali atom collisions. Fano-Feshbach resonances have been observed for a variety of cold collisions, and many of these have been well described by theoretical models. Such measurement of high partial wave resonances could be used to improve precision of theoretical models of scattering. These resonances can be calculated using a full close-coupling scheme, but this method becomes very time-consuming as the number of partial waves grows and the resolution of magnetic field is increased. Multichannel quantum defect theory allows for a much faster and quantitatively accurate calculation of these resonances for alkali atoms.

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