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Many-body Feshbach Hamiltonians in the two-body limit. NICOLAI NYGAARD, University of Aarhus, JAMES E. WILLIAMS, PAUL S. JULIENNE, NIST — We discuss how the many-body theory of a gas with interactions controlled by a Feshbach resonance can be constructed in a manner, which incorporates the correct two-body physics. This entails the introduction of an energy dependent renormalized coupling constant for atom-molecule conversion that embodies the low energy scattering properties of the entrance channel potential. We demonstrate that with this model the binding energies of the dressed Feshbach molecules may be faithfully reproduced.

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