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Coupled-channel pseudo-potential description of Feshbach resonance in two dimensions[1] KRITTIKA KANJILAL, DOERTE BLUME, Department of Physics and Astronomy, Washington State University, Pullman, WA 99164 — We derive pseudo-potentials that describe the scattering between two particles in two spatial dimensions for any partial wave m, whose scattering strength is parameterized in terms of the phase shift δ_m. Using our $m = 0$ pseudo-potential, we develop a coupled channel model with 2D zero-range interactions, which describes the two-body physics across a Feshbach resonance. Our model predicts the scattering length, the binding energy and the "closed channel molecular fraction" of two particles; these observables can be measured in experiments on ultracold quasi-2D atomic Bose and Fermi gases with present-day technology.

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