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Two-Body Resonances with Effective Field Theory[1] JABER BALALHABASHI, SEAN FLEMING, SRIMOYEE SEN, UBIRAJARA VAN KOLCK, University of Arizona — Resonance states are of particular importance for the scattering of two particles in quantum mechanics. In this talk we [**?**] build an effective field theory (EFT) description for scattering around a low-energy two-body resonance, by taking into account the subtleties of power counting for these states in an effective-range expansion (ERE). We demonstrate that a careful choice of leading order and next-to-leading order terms in an effective Lagrangian can give rise to a systematic ERE around a resonance, with controlled error estimates. We demonstrate the application of the EFT developed here by comparing phase shifts and pole positions with those of a toy model. The formalism developed in this presentation is relevant to narrow low-lying Feshbach resonances in cold atoms; our goal is to eventually describe nuclear resonances in the scattering of alpha particles.

[1]J. Balalhabashi, S. Fleming, S. Sen and U. van Kolck, "Two-Body Resonances with Effective Field Theory", in preparation.

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