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Atom Loss Resonances in a Bose-Einstein Condensate CHRISTIAN LANGMACK, D. HUDSON SMITH, ERIC BRAATEN, The Ohio State University — Atom loss resonances in ultracold trapped atoms have been observed at scattering lengths near atom-dimer resonances, at which Efimov trimers cross the atom-dimer threshold, and near 2-dimer resonances, at which universal tetramers cross the dimer-dimer threshold. We propose a new mechanism for these loss resonances in a Bose-Einstein condensate of atoms. The process of creating a large scattering length, at which the atom loss rate is measured, can form a condensate of shallow dimers. The coexisting atom and dimer condensates can be described by a low-energy effective field theory with universal coefficients that are determined by matching exact results from few-body physics. The classical field equations for the atom and dimer condensates predict narrow enhancements in the atom loss rate near atom-dimer resonances and near 2-dimer resonances from inelastic dimer collisions.

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