

Abstract Submitted
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Bound-state effects in diabatically quenched BECs JOHN CORSON, JOHN BOHN, JILA, NIST, and the University of Colorado — We investigate the dynamics of a uniform Bose-Einstein condensate following a sudden quench of the scattering length. Our focus is the time evolution of short-range correlations via the dynamical contact. We compute the dynamics using a combination of two- and many-body models, and we propose a connection between them that unifies their short-time, short-range predictions. Our two-body models are exactly solvable and, when properly calibrated, lead to analytic formulas for the contact dynamics. We observe high-contrast oscillations of the contact, and their time average is typically much larger than the Bogoliubov prediction. The condensate fraction shows similar oscillations, whose amplitude we are able to estimate. Such pronounced effects originate from the Feshbach-molecular bound state, often ignored in BEC quench calculations.

John Corson
JILA, NIST, and the University of Colorado

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