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Appearance of modulated spatial pattern in a dual-species BEC during condensate growth. SHAI RONEN, JOHN BOHN, JILA and Department of Physics, University of Colorado, LAURA HALMO, MARK EDWARDS, Department of Physics, Georgia Southern University — It has been long known that a dual-species BEC with a sufficiently large repulsive intra-species interaction becomes immiscible. In a recent experiment with Rb85 and Rb87 by the Wieman group at JILA, a complicated pattern of multiple interleaved "bubbles" of the the two species has been observed upon the end of evaporative cooling. This observation defies expectations that the ground state should only have a single boundary between the two species. We purpose a model wherein this spatial pattern is formed during condensate growth through a modulation instability mechanism. We model the growth of the condensates with a linear gain term added to the Gross Pitaevskii equation, and obtain qualitatively similar patterns to the experiment. We also predict the conditions which would maximize the number of bubbles.

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