

Abstract Submitted
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Stripe formation and anomalous dynamics of a dual species Bose-Einstein condensate in an optical lattice UTTAM SHRESTHA, University of Connecticut, JUHA JAVANAINEN, University of Connecticut, Storrs CT-06269, JANNE RUOSTEKOSKI, University of Southampton, SO17 1BJ, United Kingdom — We study the dynamical instability of a dual species Bose-Einstein condensate in an optical lattice in the limit of weak atom-atom interactions. The time evolution of the density distributions shows the mixing and demixing behavior between the two species, in contrast to the common belief that the instability leads to phase separation. We also observe a striation pattern when one species is allowed to move. The number of striations is equal to the relative phase winding of the two species. For larger flow velocity we observe a sudden jump in the overlap of the state with the initial state. This may be explained in terms of phase slip during the flow, a phenomenon closely related to Landau instability.

Uttam Shrestha
University of Connecticut

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