

Abstract Submitted  
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**Quench-Induced Phase Separation Dynamics in Two-Component Bose Einstein Condensates**<sup>1</sup> SIMEON MISTAKIDIS, GARYFALLIA KATSIMIGA, Univ Hamburg, PANAYOTIS KEVREKIDIS, University of Massachusetts, PETER SCHMELCHER, Univ Hamburg, GROUP OF FUNDAMENTAL PROCESSES IN QUANTUM PHYSICS TEAM — We investigate the many-body quench dynamics of a binary Bose-Einstein condensate crossing the miscibility-immiscibility threshold and vice versa. For particle balanced mixtures the increase of the interspecies repulsion leads to the filamentation of the density of each component. These filaments are found to be strongly correlated exhibiting domain-wall structures. Following the reverse quench scenario multiple dark-antidark solitary waves are spontaneously generated and subsequently decay. In the case of particle imbalanced mixtures fragmented domain-wall-bright complexes arise which appear to be strongly entangled. Finally, we utilize single-shot simulations to relate our findings to possible experimental realizations.

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Simeon Mistakidis  
Univ Hamburg

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