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Tunneling Dynamics of Two-Species Bose-Einstein Condensates

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Abstract: We have studied the tunneling dynamics of two-species Bose-Einstein condensates. It is shown that the population difference and the Josephson-like tunneling current between the two condensates exhibit oscillation behaviors and there exists macroscopic quantum self-trapping, which strongly depends on the initial state, interatomic nonlinear self-interaction, interspecies nonlinear interaction, and the total number of atoms in the two condensates.

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