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**Breakdown of Macroscopic Quantum Self Trapping in Coupled 1D Bose Gases** RAFAEL HIPOLITO, ROMAN BARANKOV, ANATOLI POLKOVNIKOV, Boston University — Two coupled 3D Bose-Einstein condensates with a large population imbalance exhibit macroscopic quantum self-trapping if the ratio of interaction energy to the coupling energy between the two gases is above a critical value. Above the self trapping transition, one sees only small amplitude high frequency oscillations of the population difference. In the analogous case of 1D coupled gases we find similar behavior for short times, but quantum fluctuations destroy the self trapped state by production of particle pairs of opposite momenta through parametric resonance with the oscillations of the population imbalance observed at small times. We show that through this resonance it is possible, by choosing the parameters of the system appropriately, to produce an interacting 1D bose gas with sharp momentum distribution, and show the conditions that the system must satisfy in order to produce such a state.

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