

Abstract Submitted  
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**Self-interactions of a highly degenerate quantum scalar field<sup>1</sup>**

SANKHA SUBHRA CHAKRABARTY, SEISHI ENOMOTO, YAQI HAN, PIERRE SIKIVIE, ELISA TODARELLO, Univ of Florida - Gainesville — We develop a formalism to describe how the quantum mechanical evolution of a highly degenerate scalar field differs from its classical counterpart. We apply the formalism to homogeneous condensate with attractive 4-point contact interactions. In classical description, the condensate persists forever. But, in quantum evolution, parametric resonance causes the quanta to jump out of the condensate in pairs. Modes with wave-vectors less than a critical value become populated. We calculate the time-scale over which the homogeneous condensate gets depleted and the classical description becomes invalid.

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