Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Sudden Quench non-Equilibrium Dynamics of Spinor Condensates CEREN DAG, SHENG-TAO WANG[1], LU-MING DUAN, Univ of Michigan - Ann Arbor — We classify the diverse dynamical behaviour of spin-1 Bose-Einstein condensates through sudden quenches. The observed behavior can be summarized under well-defined quantum collapse and revivals, thermalization, and certain special cases. These special cases are either nonthermal equilibration with no revival but a collapse even though the system has finite degrees of freedom or no equilibration with no collapse and revival. We explain why and when eigenstate thermalization hypothesis (ETH) holds for spinor condensates via numerical scaling arguments and showing the equivalence between microcanonical and diagonal ensemble predictions in long-time limit. The reason behind both thermalizing and nonthermalizing behaviours in the same model under different initial conditions is linked to the discussion of 'rare' nonthermal states existing in the spectrum. By expanding the analysis to the participation ratio calculations of the spectrum, we make a link between the thermalization and localization properties of the spinor condensates. Furthermore, we present an explanation to the behaviours of the special cases demonstrated in the model.

[1]currently at Harvard University.

Ceren Dag
Univ of Michigan - Ann Arbor

Date submitted: 26 Jan 2018 Electronic form version 1.4