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Universality of nonthermal behavior in spinor Bose condensates[1]
YOGESH SHARAD PATIL, HIL F. H. CHEUNG, AIRLIA SHAFFER, HUIYAO Y. CHEN, MUKUND VENGALATTORE, Cornell University — Spinor Bose condensates exhibit a rich phase diagram with varied magnetic ordering and topological defects because of the close competition between their spin and charge dependent interactions. Quenching such a spinor condensate into a ferromagnetic state realizes robust non-equilibrium and prethermalized states whose macroscopic behavior differs from thermodynamic predictions. In previous work, we have identified the microscopic origin of prethermalization in Rubidium spinor gases as being the disparate energy scales of the phonon and magnon excitations in this gas [1]. This identification of the microscopic origin enables us to broaden the scope of our studies to address fundamental questions regarding the equilibration of isolated quantum systems. We will discuss our recent results that suggest the universality of this coarsening behavior and evidence that this system can be mapped on to a non-thermal fixed point studied in high energy field theories [2].

[1] R. Barnett, A. Polkovnikov, and M. Vengalattore, Phys. Rev. A 84, 023606 (2011)
[2] J. Berges, arXiv:1503.02907 (2015)

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