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Collapse and revival of the Fermi sea in a Bose-Fermi mixture DEEPAK IYER, The Pennsylvania State University, SEBASTIAN WILL, Massachussetts Institute of Technology, MARCOS RIGOL, The Pennsylvania State University — The collapse and revival of quantum fields is one of the most pristine forms of coherent quantum dynamics far from equilibrium. Until now, it has only been observed in the dynamical evolution of bosonic systems. We report on the first observation of the boson mediated collapse and revival of the Fermi sea in a Bose-Fermi mixture. Specifically, we present a simple model which captures the experimental observations shown in the talk titled *Observation of Collapse and Revival Dynamics in the Fermionic Component of a Lattice Bose-Fermi Mixture* by Sebastian Will. Our theoretical analysis shows why the results are robust to the presence of harmonic traps during the loading or the time evolution phase. It also makes apparent that the fermionic dynamics is independent of whether the bosonic component consists of a coherent state or localized Fock states with random occupation numbers. Because of the robustness of the experimental results, we argue that this kind of collapse and revival experiment can be used to accurately characterize interactions between bosons and fermions in a lattice.

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