

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Non-Fermi glasses: fractionalizing electrons at finite energy density¹ SIDDHARTH PARAMESWARAN, University of California, Irvine, SARANG GOPALAKRISHNAN, CUNY College of Staten Island, Staten Island, NY 10314 USA — Non-Fermi liquids are metals that cannot be adiabatically deformed into free fermion states. We argue for the existence of “non-Fermi glasses,” which are phases of interacting disordered fermions that are fully many-body localized, yet cannot be deformed into an Anderson insulator without an eigenstate phase transition. We explore the properties of such non-Fermi glasses, focusing on a specific solvable example. At high temperature, non-Fermi glasses have qualitatively similar spectral features to Anderson insulators. We identify a diagnostic, based on ratios of correlation functions, that sharply distinguishes between the two phases even at infinite temperature. We argue that our results and diagnostic should generically apply to the high-temperature behavior of the many-body localized descendants of fractionalized phases.

¹S.A.P. is supported by NSF Grant DMR-1455366 and a UC President’s Research Catalyst Award CA-15-327861, and S.G. by the Burke Institute at Caltech.

Siddharth Parameswaran
University of California, Irvine

Date submitted: 11 Nov 2016

Electronic form version 1.4