Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Characterizing eigenstate thermalization via measures in the Fock space of operators** XIAO-LIANG QI, PAVAN HOSUR, Stanford Univ — The eigenstate thermalization hypothesis (ETH) attempts to bridge the gap between quantum mechanical and statistical mechanical descriptions of isolated quantum systems. Here, we define unbiased measures for how well the ETH works in various regimes, by mapping general interacting quantum systems on regular lattices onto a single particle living on a high-dimensional graph. By numerically analyzing deviations from ETH behavior in the non-integrable Ising model, we propose quantities that we call the "n-weight" and the "n-distinguishability" to democratically characterize the average and the maximum deviations, respectively, for all operators residing on n sites. Along the way, we discover that complicated operators on average are worse than simple ones at distinguishing between neighboring eigenstates, contrary to the naive intuition created by the usual statements of the ETH that few-body (many-body) operators acquire the same (different) expectation values in nearby eigenstates at finite energy density.

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Date submitted: 05 Nov 2015 Electronic form version 1.4