Detection of Symmetry Enriched Topological Phases FRANK
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plex Systems, XIE CHEN, University of California, Berkeley — Topologically or-
dered systems in the presence of symmetries can exhibit new structures which are
referred to as symmetry enriched topological (SET) phases. We introduce simple
methods to detect the SET order directly from a complete set of topologically de-
generate ground state wave functions. In particular, we first show how to directly
determine the characteristic symmetry fractionalization of the quasiparticles from
the reduced density matrix of the minimally entangled states. Second, we show
how a simple generalization of a string order parameter can be measured to detect
SETs. The usefulness of the proposed approached is demonstrated by examining
two concrete model states which exhibit SET: (i) a spin-1 model on the honeycomb
lattice and (ii) the resonating valence bond state on a kagome lattice.

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