General symmetry fractionalizations of topologically ordered systems in two dimensions[1] HAO SONG, MICHAEL HERMELE, Univ of Colorado - Boulder — A framework is presented to describe symmetry fractionalizations for a generic topological order in two dimensions, via studying the operator algebra of quantum systems. We give a precise definition of symmetry fractionalizations, including those relevant to space group symmetry and time reversal symmetry. Examples are given to apply this framework to exactly solvable local bosonic models with abelian or non-abelian topological order. In addition, the general relations among fractional quantum numbers carried by different anyon species are derived. This framework is applicable in particular to gapped quantum spin liquids, fractional Chern insulators, and fractional topological insulators.

Hao Song
Univ of Colorado - Boulder

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