

NON-INVERTIBLE SYMMETRIES AND SPT PHASES IN 2+1D LATTICE MODELS

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We will discuss an example of fusion 2-category symmetry that involves 1-form symmetry and non-invertible symmetry on the lattice with a tensor product Hilbert space. We start by motivating why realizing generalized symmetries on the lattice with tensor product Hilbert space is an interesting and non-trivial question. After highlighting the difference of “topological” vs “non-topological” 1-form symmetry on the lattice, we discuss how non-invertible symmetry naturally appears in a simple family of lattice models. This non-invertible symmetry is shown to be anomaly free, by finding mutually commuting Hamiltonians with unique ground state. Such Hamiltonians describe the SPT for non-invertible symmetry, and we find two such SPT phases. We will conclude by discussing several open problems.