

Abstract Submitted
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Some tensor-network diagnostics for a class of 2D SPT states with internal symmetry ABHISHODH PRAKASH, TZU-CHIEH WEI, Stony Brook University — We demonstrate some diagnostic techniques to characterize certain 2D tensor network states with internal symmetries that are classified by the third group cohomology of the symmetry group. We use the discussions of Else et al. [Phys. Rev. B 90, 235137 (2014)] to extract data that determines the phase of matter from the tensors that make up a specific class of wave functions. This is possible because the symmetry transformation at the ‘physical’ level, which is of product form, translates to a symmetry in the ‘virtual’ level which may no longer be of product form. An appropriate analysis of the virtual-space symmetry helps us obtain the topological information (the 3-cocycle twist) that places the wave function in the classification scheme. This reproduces the results of Chen et al. [Phys. Rev. B 87,155114 (2013)] without using projection operators in merging two ‘Matrix Product Operators’ of the symmetry representation of two group actions.

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