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Characterizing gapped phases of a 1D spin chain with on-site and spatial symmetries[1] COLIN WEST, ABHISHODH PRAKASH, TZU-CHIEH WEI, State Univ of NY- Stony Brook — We investigate the phase diagram of a spin-1 chain whose Hamiltonian is invariant under translation, lattice inversion and a global A_4 symmetry in the spin degrees of freedom. The classification scheme by Chen, Gu, and Wen allows us to enumerate all possible phases under the given symmetry. Then, we determine which of these phases actually occur in the two-parameter Hamiltonian. Using numerical methods proposed by Pollmann and Turner (2012) we determine the characteristic projective parameters for the Symmetry Protected Topological (SPT) phases. In addition, we present a method for determining the projective commutation parameter in these phases. The resulting phase diagram is rich and contains at least nine different SPT phases.

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