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Interaction effects on Mirror symmetry protected topological phases[1] ZI YANG MENG, CHUANG CHEN, Institute of Physics, Chinese Academy of Sciences, YUAN-YAO HE, Department of Physics, Renmin University of China, XIAO YAN XU, CHEN FANG, Institute of Physics, Chinese Academy of Sciences — Employing large-scale fermionic quantum Monte Carlo simulations, we investigate the interaction effects on the mirror symmetry protected topological phases. We design a 2D tight-binding model based on honeycomb lattice, where each lattice site has two orbitals with opposite parity. Spin-orbital coupling and inter-orbital hopping terms give rise to nonzero integer mirror Chern number of the noninteracting system. Upon adding electronic interactions, we explore the possibility that the Z-group classification be reduced to a smaller group, i.e., two topologically inequivalent phases in the noninteracting limit can adiabatically evolve into each other in the presence of interaction without symmetry breaking.

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