
AMANDA YOUNG, University of Arizona

On the stability of frustration-free gapped ground states of quantum lattice systems

Gapped quantum spin systems with topologically ordered ground states have been of interest due to their potential for developing fault-tolerant quantum codes. A key feature of such models is that the spectral gap remains open in the presence of small, local perturbations. Several results in this direction are due to Bravyi-Hastings-Michalakis (2010), Bravyi-Hastings (2011), and Michalakis-Zwolak (2013). These results, however, are only proved for quantum spin models with periodic boundary conditions and a unique infinite volume frustration-free ground state. Our work extends these results in several directions: including to quantum spin systems with more general boundary conditions, quantum spin systems with discrete symmetry breaking, and lattice fermion models.