

Non-Abelian Statistics in a Quantum Antiferromagnet

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Non-abelian anyons are traditionally associated with the Pfaffian state for an incompressible quantum Hall state at filling fraction $\nu = 1/2$, a state thought to be realized experimentally in the second Landau level, *i.e.*, at $\nu = 5/2$. The characteristic property is that states with many non-abelian anyons possess an internal degeneracy. The internal space configuration changes as the particles are adiabatically interchanged, *i.e.*, the space is spanned by the different permutations of otherwise identical particles. Since the internal configurations are insensitive to external perturbations which do not move the particles, non-abelian anyons have received exceptional interest in the field of quantum computing. In this work, we present a universality class of two dimensional spin liquids for spin 1 antiferromagnets which support spinon excitations obeying non-abelian statistics. We motivate a Hamiltonian which we expect to stabilize these spin liquids.