# ANYONS IN INFINITE QUANTUM SYSTEMS

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Anyons are (quasi)particles or excitations that exhibit braid statistics (as opposed to symmetric Bose/Fermi statistics). Such excitations play a crucial role in topological quantum computing. A well known example of a model with anyonic excitations is Kitaev's toric code. This model is usually defined on a graph drawn on a torus, with at each edge a spin-1/2 degree of freedom. In this talk we will discuss a variation of this model, comprising of a countably infinite number of spin-1/2 sites on a two-dimensional plane (i.e., in the thermodynamic limit). It turns out that all relevant properties of the excitations can be derived from a few basic principles. In this particular example, each anyonic excitation corresponds to a certain automorphism of the ($C^*$-)algebra of observables. Such an automorphism describes how the observables are affected by the presence of this excitation. By studying these maps, together with their intertwiners, one can recover, for example, the statistics of the excitations. This can all be described elegantly in the language of braided tensor categories. Finally, we point out some generalisations to a wider range of models, in particular those containing so-called non-abelian anyons.