Title:	Reasonable Quantum Information Theary of Anyons
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Abstract:	This thesis aims to formulate a reasonable quantum information theory of anyons, one which is consistent with previous results of anyon models. We study how the unique ex- change statistics of anyons sets anyonic systems apart and its implication in quantum in- formation theory. We try to explore the structure of a typical anyonic state space, operator space and multi-partite product spaces. We also try to study previous definitions of partial trace of anyons and try to put forward a definition of our own. Using this construction, we then try to prove the existence of charge superselection in anyonic systems. This is done by showing the violation of No-Signalling Principle for non superselection respecting states. This thesis also involves a study of category theory in the study of quantum systems. We look at different categories and see how various quantum systems such as a single qubit system, a multi qubit system, fermions and bosons can be represented by a category. We look at modular tensor categories which have been previously studied in the context of topological quantum computation and use this approach to construct a category for anyons. These results which are first studied keeping in mind Abelian anyons are then modified to account for non-Abelian anyons as well.
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