Title  A study of time reversal symmetry of abelian anyons

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Abstract  We present a study of time reversal symmetry of abelian anyons $A$ in 2+1 dimensions, in the spin structure independent cases. We will find the importance of the group $C$ of time-reversal-symmetric anyons modulo anyons composed from an anyon and its time reversal. Possible choices of local Kramers degeneracy are given by quadratic refinements of the braiding phases of $C$, and the anomaly is then given by the Arf invariant of the chosen quadratic refinement. We also give a concrete study of the cases when $|A|$ is odd or $A = (\mathbb{Z}_2)^N$. 