



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

Anomalies of (1+1)D Categorical Symmetries

by

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ALL INTERESTED ARE WELCOME

Abstract

We present a general approach for detecting when a fusion category symmetry is anomalous, based on the existence of a special kind of Lagrangian algebra of the corresponding Drinfeld center. The Drinfeld center of a fusion category $\mathcal{A}$ describes a $(2+1)D$ topological order whose gapped boundaries enumerate all $(1+1)D$ gapped phases with the fusion category symmetry, which may be spontaneously broken. There always exists a gapped boundary, given by the *electric* Lagrangian algebra, that describes a phase with $\mathcal{A}$ fully spontaneously broken. The symmetry defects of this boundary can be identified with the objects in $\mathcal{A}$. We observe that if there exists a different gapped boundary, given by a *magnetic* Lagrangian algebra, then there exists a gapped phase where $\mathcal{A}$ is not spontaneously broken at all, which means that $\mathcal{A}$ is not anomalous. In certain cases, we show that requiring the existence of such a magnetic Lagrangian algebra leads to highly computable obstructions to $\mathcal{A}$ being anomaly-free. As an application, we consider the Drinfeld centers of $\mathbb{Z}_N \times \mathbb{Z}_N$ Tambara-Yamagami fusion categories and recover known results from the study of fiber functors. This talk will be based on arXiv:2304.01262.