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Graphical calculus in symmetric monoidal (∞ -) categories with duals

Graphical calculi are a sort of techniques to compute morphisms in monoidal categories, and a really general and geometric formalization was given by Joyal and Street [3]. In this talk, we focus on that in symmetric monoidal categories with duals. They are examples of pivotal categories, and it is vaguely believed by researchers in quantum representation theory that pivotal categories are described by a calculus of planar tangles (see [2] for example). We give a purely geometric description for this calculus and, using the Cobordism Hypothesis [1] (proved by Lurie [4]), show every symmetric monoidal category admits a graphical calculus in a coherent way so that we can extend it to the ∞ -contexts. This also gives an extension of [5].

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