早大理工トポロジーセミナーのお知らせ

Non-semisimple graded extended TQFTs

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日時： ２０１６年 １１月２１日（月） １６：３０ ～
November 21 (Monday)

場所： 早稲田大学 西早稲田キャンパス
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Abstract

The quantum invariants of 3-manifolds defined by Costantino, Geer and Patureau in 2014 are a non-semisimple and graded version of Witten-Reshetikhin-Turaev ones. They are built out of certain ribbon categories which are modeled on complex weight representations of a version of quantum $sl(2)$ at a root of unity. We can upgrade these invariants to extended TQFTs by using a non-semisimple and graded relative of the concept of modular category which includes the example of $sl(2)$. The result is obtained via a graded version of the Universal Construction introduced by Blanchet, Habegger, Masbaum and Vogel and it agrees with the TQFTs constructed by Blanchet, Costantino, Geer and Patureau in 2016. The non-semisimplicity of the theory is witnessed by the images of these ETQFTs, which can map critical objects of the cobordism 2-category to non-semisimple graded linear categories.

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