
On the properties of quantum representations of mapping class groups of surfaces

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Résumé

The Witten-Reshetikhin-Turaev quantum representations are (families of) projective representations of mapping class groups of surfaces, with striking properties: the Dehn twists have finite image, but the representations have a unitary structure and infinite images. We will give a construction of the $SO(3)$ -variant of WRT representations as part of the TQFTs underlying the $SO(3)$ -Witten-Reshetikhin-Turaev invariants of 3-manifolds. We will discuss two deep theorems about WRT-representations: asymptotic faithfulness and the density of the image. Finally, we will present some results about the AMU conjecture, which explains how pseudo-Anosov mapping classes are detected by quantum representations. We will also give restrictions on the kernel of quantum representations at fixed level.

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