

Skein algebras and non-abelianization

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Abstract

The skein algebra of a surface S was introduced by Przytycki and Turaev, and is a quantization of the SL_2 -character variety of S (i.e. the moduli space of flat SL_2 -connections on S). It provides an approach to constructing quantum field theories. Bonahon and Wong constructed the quantum trace, which embeds the skein algebra into the balanced Chekhov-Fock algebra. The latter is a quantization of the enhanced Teichmüller space. An advantage of the balanced Chekhov-Fock algebra is its relative simplicity (it is a quantum torus), which makes manageable the study of the representations of the skein algebra. On the other hand, Lê recently introduced a stated version of the skein algebra, which involves the boundary of the surface. A powerful property of Lê's stated skein algebra is its well-behaviour under gluing of surfaces. We will discuss further properties of the stated skein algebra, describe its irreducible representations, and give an interpretation of the quantum trace map and the Chekhov-Fock algebra in terms of Non-abelianization. The latter relates the SL_2 flat connections on a surface S with the $U1$ flat connections on a 2-fold branched covering of S . This is a work in progress, in common with J. Korinman.