

HOMOLOGICAL AND GEOMETRICAL REPRESENTATIONS OF THE BRAID GROUP

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We will present a result due to Kohno, where he identifies two braid group representations which have homological and geometrical flavours respectively.

The theory of KZ-equations (Knizhnik-Zamolodchikov) comes from physics and leads to a flat connection on the complement of the hyperplane braid arrangement. This form is valued in a bundle with fiber the tensor power of the $sl(2)$ -Verma module. The monodromy of this connection leads to a representation of the braid group onto the space of so called "null-vectors" of the Verma module.

On the other hand, in 1993, R. Lawrence introduced a sequence of homological representations for braid groups using the homology of a certain covering of the configuration space on the punctured disc.

In 2012, Kohno proved that the KZ-representation of the braid group is isomorphic to a certain specialisation of the homological Lawrence representation. The aim of the talk is to present the main ideas of this proof.

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