The algebraic structures associated with the monodromy of the Knizhnik-Zamolodchikov equation

Valentina Goloubeva, All-Russian Institute of scientific and technical information, Dept. Mathematics. Moscow, Russia.

ABSTRACT

The object of the investigation is to describe the state of matter in the higher-dimensional Riemann-Hilbert problem for the generalized Knizhnik-Zamolodchikov equations associated to the different root systems. The Drinfeld-Kohno theorem solves such a problem for the classical Knizhnik-Zamolodchikov equation associated to the root system of A_n type. It characterizes the representations of the Artin braid group that can be realized as monodromy of the classical Knizhnik-Zamolodchikov equation. At the present time there are a series of papers devoted to the investigations of the representations of the Brieskorn braid groups corresponding, for example, to the root system B_n (T. tom Dieck, R.Hoering-Oldenburg, V.A. Golubeva, V.P. Leksin). Continuing the Drinfeld-Kohno line of investigations, it is natural to connect these representations with the generalized Knizhnik-Zamolodchikov equations, i.e. to state the problem on the algebraic characterization of the representations that could be realizable as a monodromy of some Knizhnik-Zamolodchikov equation. The results in this direction will presented. In particular, the geometrical interpretation of the Brieskorn braid group of the B_n type and its representation in the category of the chord diagrams, the definitions of the corresponding R-matrices and associators Φ (of the B_n type) will be given. The connections between R and Φ will be discussed. The variant of the generalization of the Drinfeld-Kohno theorem to the case of the Knizhnik-Zamolodchikov equation associated with the root system B_n will be stated. The cases of the other root systems will be touched.