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Multiplicative middle convolution for KZ-type equations and construction of representations of braid groups

There are various ways to define braid groups B_n. One is to view it as the fundamental group of the configuration space of unordered n-points on the complex plane, and another is to view it as the mapping class group of a disk with n-points, and so on. The monodromy representation for KZ-type equations is the anti-representation of the pure braid group P_n through the former view. In Paper [1], Haraoka obtained a method to construct a new anti-representation of the P_n from any given anti-representation of the P_n through multiplicative middle convolution of the KZ-type equation.

In this talk, we will apply the Katz-Long-Moody construction, a construction method of representations of braid groups mentioned in [2], to the case of P_n and discuss the correspondence with Haraoka's construction method. Then, we will describe some properties shown by the correspondence.

References

[1] Y. Haraoka, *Multiplicative middle convolution for KZ equations*, Mathematische Zeitschrift (2020)
[2] K. Hiroe and H. Negami, *Long-Moody construction of braid representations and Katz middle convolution*, https://arxiv.org/pdf/2303.05770.pdf