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Braid group action on the cohomology of Deligne-Lusztig varieties

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If B is the braid group associated with the Weyl group W of a split reductive group G over F_q, and if b is in B, we construct a categorical action of the centralizer C_B(b) on the cohomology of the Deligne-Lusztig variety X(b) associated with b. If b=1, we retrieve the classical algebraic action of the Hecke algebra on the permutation representation of the finite flag variety. As another particular case, we retrieve a geometric action defined by Broué-Michel in 1996.

In this talk, we explain the construction of this action, some of its properties (action of the Frobenius, compatibility with Deligne-Lusztig parabolic induction, ...) and we investigate natural questions (for instance, does the image of C_B(b) generate the endomorphism algebra?).

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