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On Involutions in Weyl Groups

Let (W, S) be a Coxeter system and $*$ be an automorphism of W with order ≤ 2 such that $s^* \in S$ for any $s \in S$. Let I_* be the set of twisted involutions relative to $*$ in W. In this paper we consider the case when $* = \mathrm{id}$ and study the braid I_*-transformations between the reduced I_*-expressions of involutions. If W is the Weyl group of type B_n or D_n, we explicitly describe a finite set of basic braid I_*-transformations for all n simultaneously, and show that any two reduced I_*-expressions for a given involution can be transformed into each other through a series of basic braid I_*-transformations. In both cases, these basic braid I_*-transformations consist of the usual basic braid transformations plus some natural "right end transformations" and exactly one extra transformation. The main result generalizes our previous work for the Weyl group of type A_n.

Keywords: Weyl groups, Hecke algebras, twisted involutions.

MSC: 20F55; 20C08