

Bruhat Intersections for Reductive Monoids

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Bruhat intersections for reductive groups have been studied and are useful in several areas of mathematics such as Kazhdan-Lusztig theory, canonical bases and Lie theory. In this talk we consider Bruhat intersections for reductive monoids. These intersections arise from the following decompositions for a reductive monoid M :

$$M = \bigsqcup_{\sigma, \theta \in R} (B\sigma B \cap B^{-}\theta B)$$

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where B is a Borel subgroup of the unit group G of M and R is the Renner monoid, the analogue of the Weyl group for a reductive group. The main results determine the conditions under which each of the intersections appearing above are nonempty. This work gives rise to two new nontrivial orderings on R . Combinatorial descriptions of these orderings are given and their relation to the Bruhat-Chevalley order is discussed.