

Shelling Bruhat Order and the Proof of a Conjecture of Thomas Lam

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Matthew Dyer’s proof that reflection orders give rise to lexicographic shellings for Bruhat order relied on the fact that the number of so-called ascending chains in a closed interval in Bruhat order is the leading coefficient in a polynomial closely related to the Kazhdan–Lusztig polynomial. We give a new, purely combinatorial proof that reflection orders yield shellings for Bruhat order based on a seemingly new characterization of cover relations in Bruhat order. In related work, we also prove a conjecture of Thomas Lam that face posets of stratified spaces of response matrices of electrical networks are lexicographically shellable.

We will discuss this work, parts of which are joint work with Rick Kenyon.

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