

1103-16-195

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Lattice quotients of weak order and algebra quotients of preprojective algebras. Preliminary report.

Certain lattice quotients of weak order on a finite simply-laced Coxeter group arise as the lattice of torsion classes of quotients of preprojective algebras. This includes the Cambrian quotients and many more. I will explain the general setting, and then focus on type A , in which we can characterize explicitly which lattice quotients appear, and also show that these are exactly the simplicial quotients (i.e., those such that the corresponding coarsening of the Coxeter fan is simplicial). This gives a combinatorial criterion for when a lattice quotient of weak order in the symmetric group is simplicial; no combinatorial criterion was known previously. (Received August 19, 2014)