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Kac-Moody groups, double Bruhat cells, and cluster algebras

Kac-Moody groups and cluster algebras, while being fundamentally different objects, share surprisingly many notable features. For example they are both classified in terms of root systems and Dynkin diagrams. Many varieties naturally associated to Kac-Moody groups carry a cluster algebra structure but, in general, its type is not related to the type of the group itself.

Motivated by this clash of types, Yang and Zelevinsky studied a particular class of reduced double Bruhat cells of a Lie group and proved that their rings of coordinates are cluster algebras with principal coefficients of the same type of the underlying group. Moreover, and arguably more interestingly, they were able to give expressions for all the cluster variables in terms of generalized minors.

In this talk I will present an ongoing work, joint with D. Rupel and H. Williams, in which we extend the results by Yang and Zelevinsky to any Kac-Moody group.