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Blowup Coxeter groups and their computational complexity

Discrete reflection groups form a rich class of examples in Geometric group theory. More generally, Coxeter groups have many properties of interest to geometric group theorists, such as non-positive curvature, cubulations and biautomaticity.

In this talk, we investigate a natural analogue of blowups in the theory of Coxeter groups, called *Blowup Coxeter groups*. We show that our favorite properties enjoyed by Coxeter groups are preserved by their blowups. Namely, we show that they are biautomatic. In essence, this means that their structure can be encoded via a regular language that is insensitive to small perturbations by right and left multiplication of the group.

For simplicity, the talk will mostly focus on the special case of the Coxeter group of type $\widetilde{A}_2$, whose Cayley graph is the tiling of the plane by hexagons. However, the presented results apply to all Coxeter groups and their blowups.

Joint work with Piotr Przytycki.