

# Geometry and Representation Theory — Seminar —

## THE BOUNDED DERIVED CATEGORY FOR COMINUSCULE POSETS

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### Abstract

Cominuscule posets come from root posets and have connections to Lie theory and Schubert calculus. We are interested in whether the bounded derived category of the incidence algebra of a cominuscule poset is fractionally Calabi-Yau. In other words, we ask if some non-zero power of the *Serre functor* is a shift functor. We answer this question on the level of the Grothendieck groups. On the Grothendieck group this functor becomes an endomorphism called the *Coxeter transformation*. We show that Coxeter transformation has finite order for two of the three infinite families of cominuscule posets, and for the exceptional cases. Our motivation comes from a conjecture by Chapoton which states that the bounded derived category of incidence algebra of root posets is fractionally Calabi-Yau. Our result can be thought of as a parabolic analogue of Chapoton's conjecture.

Monday, 24 September 2018  
16:30–17:30  
319 Jeffery Hall