1107-05-130 **Fu Liu***, fuliu@math.ucdavis.edu, and **Federico Castillo**. *Ehrhart positivity for generalized permutohedra.*

The Ehrhart polynomial $i(P, m)$ of an integral polytope P counts the number of lattice points in dilations of P. It is well known that the leading, second, and last coefficients of $i(P, m)$ are the volume of P, one half of the volume of the boundary of P and 1, respectively, and thus are all positive. However, it is not true that all the coefficients of $i(P, m)$ are positive.

There are few families of polytopes that are known to have positive Ehrhart coefficients. De Loera et al conjectured that matroid polytopes have this property. In our work, we consider generalized permutohedra, which contain matroid polytopes, and conjecture they all have positive Ehrhart coefficients.

We first reduce our conjecture to another conjecture which only concerns regular permutohedra, a smaller family of polytopes. The key ingredients in the reduction are perturbation methods and a valuation on the algebra of rational pointed polyhedral cones constructed by Berline and Vergne. Then we are able to show that the third and fourth Ehrhart coefficients of regular permutohedra are always positive by explicitly computing Berline-Vergne's valuation for our polytopes. We also obtain partial results on the coefficients of the linear terms. (Received January 09, 2015)