Fans, simplicial complexes and polytopes in tilting theory

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The notion of tilting objects is basic to study the structure of a given derived category. The class of silting objects gives a completion of the class of tilting objects from the point of view of mutation, and they correspond bijectively with other important objects in the derived category. The subset of 2-term silting complexes enjoys especially nice properties, which is closely related to τ-tilting theory and cluster theory. In this talk, we discuss the notion of g-simplicial complexes, g-polytopes and g-fans, which is defined from 2-term silting complexes. We study several properties of these three objects. In particular, we give tilting theoretic interpretations of the h-vectors and Dehn-Sommerville equations of the g-simplicial complex. Moreover, we discuss the convexity of the g-polytope and its dual polytope. We also discuss a classification of rank 2 g-fans. This is joint work with Aoki-Higashitani-Iyama-Kase.

References

[1] Fans and polytopes in tilting theory I: Foundations

[2] Fans and polytopes in tilting theory II: g-fans of rank 2

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