

## BIER SPHERES - STARSHAPEDNESS AND POLYTOPALITY

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ABSTRACT. Bier sphere  $Bier(K) = K *_{\Delta} K^{\circ}$  is a simplicial complex defined as join of a simplicial complex  $K$  and its Alexander dual. It has no a priori geometric realization and, while combinatorially a sphere, in general it is not polytopal. We examine the questions of polytopality and non-polytopal geometric realizations. In particular, we show that all Bier spheres are starshaped and that Bier sphere associated to threshold complexes are polytopal.

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