The colored symmetric and exterior algebras

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Abstract

In this extended abstract we present colored generalizations of the symmetric algebra and its Koszul dual, the exterior algebra. The symmetric group Sn acts on the multilinear components of these algebras. While Sn acts trivially on the multilinear components of the colored symmetric algebra, we use poset topology techniques to describe the representation on its Koszul dual. We introduce an Sn-poset of weighted subsets that we call the weighted boolean algebra and we prove that the multilinear components of the colored exterior algebra are Sn- isomorphic to the top cohomology modules of its maximal intervals. We show that the two colored Koszul dual algebras are Koszul in the sense of Priddy et al.

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