

CELLULAR BINOMIAL IDEALS

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Without any restrictions on the base field, we compute the hull and provide an unmixed decomposition of a cellular binomial ideal. The latter had already been proved by Eisenbud and Sturmfels in characteristic zero, and conjectured to also hold in positive characteristic. Over an algebraically closed field, we further obtain an explicit (but not necessarily minimal) primary decomposition of such an ideal.

The binomial primary decomposition algorithms developed by Eisenbud and Sturmfels, and improved by Ojeda and Piedra, and Kahle, perform a cellular decomposition as a first step. We believe that our results provide further improvements to these algorithms, paving the way for the implementation of binomial primary decomposition over finite fields.

Joint work with Zekiye Sahin Eser (Texas A&M University, USA).