

CODIMENSION TWO A -HYPERGEOMETRIC SYSTEMS

Laura Felicia Matusevich

Texas A&M University, USA

`laura@math.tamu.edu`

A -hypergeometric systems are systems of partial differential equations associated to toric ideals, introduced by Gelfand, Graev, Kapranov and Zelevinsky in the late 1980s. Homological methods have proved exceedingly effective in studying hypergeometric equations, and provide the only known way of computing the dimension of the solution space of a hypergeometric system. However, homological considerations have so far failed to explain how the solutions themselves behave.

I will explain an approach towards bridging this gap in the case of codimension two lattice ideals. Using the combinatorial minimal free resolutions of codimension two lattice ideals constructed by Peeva and Sturmfels, I will present Ext and local cohomology computations, which, taken together, control the behavior of the corresponding A -hypergeometric functions. Along the way, we give an explicit combinatorial formula for the graded local duality isomorphisms in this case.

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