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Generalized Newton Complementary Duals of Monomial Ideals

Given a monomial ideal in a polynomial ring over a field, we define the generalized Newton complementary dual of the given ideal. The Newton complementary duals of monomial ideals were first introduced by Costa and Simis. We show good properties of such duals including linear quotients and isomorphisms between the special fiber rings. We construct the cellular free resolutions of duals of strongly stable ideals generated in the same degree. When the base ideal is generated in degree two, we provide an explicit description of cellular free resolution of the dual of a compatible generalized stable ideal. This is joint work with Katie Ansaldi and Yi-Huang Shen.