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The j -Multiplicity of Monomial Ideals

The j -multiplicity was introduced by Achilles and Manaresi in 1993 as a generalization of the Hilbert-Samuel multiplicity for arbitrary ideals in a Noetherian ring. Many of the properties and algebraic applications of the Hilbert-Samuel multiplicity of \mathfrak{m} -primary ideals have been extended to more general classes of ideals using the j -multiplicity. In this talk we will discuss joint work with Jonathan Montaño in which we give a description of the j -multiplicity of a monomial ideal as the normalized volume of a polytopal complex.