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Sudipta Das* (sudiptad@nmsu.edu), 625 E University Ave, Las Cruces, NM 88005. A

Volume=Multiplicity formula for p-family of ideals in positive characteristic. Preliminary report.

In this talk, I will present my research on the asymptotic behavior of certain families of ideals in prime characteristic called p-families. These families are ubiquitous in the theories of tight closure, Hilbert-Kunz Multiplicity, and F-signature and studied extensively in the joint work of Jeffries and Hernandez. We associate with each p-family of ideals, an object in Euclidean space called a p-body, which is similar to a Newton-Okounkov body for a graded family of ideals. The existence of volume of this Newton-Okounkov body has been extensively studied in the work of Ein, Lazarsfeld, Smith, and Mustata. Later, Kaveh and Khovanskii used valuation theory to associate convex bodies to the graded family of ideals, and this has been greatly expounded in the work of Cutkosky. Motivated by this, using "OK" valuation in my current research work, I have proved (among other things) a Fujita-type approximation theorem and showed that the volume of a p-body is equal to the asymptotic limit of Hilbert-Kunz multiplicities. (Received January 25, 2022)