MANIN’S CONJECTURE FOR A CLASS OF SINGULAR HYPERSURFACES

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Abstract: Let $n$ be a positive multiple of 4 or $n = 2$. In this talk, we shall show how to establish an asymptotic formula for the number of rational points of bounded height on singular cubic hypersurfaces $S_n$ defined by

$$x^3 = (y_1^2 + \cdots + y_n^2)z,$$

by analytic method. This result is new in two aspects: first, it can be viewed as a modest start on the study of density of rational points on those singular cubic hypersurfaces which are not covered by the classical theorems of Davenport or Heath-Brown; second, it proves Manin’s conjecture for singular cubic hypersurfaces $S_n$ defined above. (Joint works with Régis de la Bretèche, Jianya Liu & Yongqing Zhao)