

ABSTRACT:

(joint w/ A. Venkatesh) We present some new upper bounds for numbers of rational points of bounded height on curves and some higher-dimensional varieties. The main idea is to combine the ideas of Bombieri-Pila and Heath-Brown with descent arguments involving étale covers of the variety. For instance: Heath-Brown shows that the number of rational points of height at most H on a degree- d plane curve is bounded by $C \cdot H^{2/d}$, where C is a constant not depending on the curve. This theorem is sharp in general, but we show that the additional hypothesis that the curve has positive geometric genus allows an improvement of the exponent.