O-minimality and diophantine geometry

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Abstract

O-minimality, a branch of model theory, has recently found applications in the solution of arithmetical problems from diophantine geometry, most notably due to Pila [1]. We describe the Pila-Zannier method for proving the Manin-Mumford conjecture, which provides upper bounds for the number of torsion points of algebraic varieties. The method consists of transforming the algebraic setting into an analytic one where torsion points of algebraic varieties become rational points of sets "definable" in an o-minimal structure, and then applying the Pila-Wilkie theorem from o-minimality which provides upper bounds for the number of those rational points. A relevant survey is [2].
