

1176-11-275

Raymond van Bommel, Edgar Costa, Wanlin Li* (liwanlin@crm.umontreal.ca), **Bjorn Poonen** and **Alexander Smith**. *Abelian varieties of prescribed order over finite fields*.

Given a prime power q and $n \gg 1$, we prove that every integer in a large subinterval of the Hasse–Weil interval is the order of a geometrically simple ordinary principally polarized abelian variety of dimension n over \mathbb{F}_q . As a consequence, we generalize a result of Howe and Kedlaya for \mathbb{F}_2 to show that for each prime power q , every sufficiently large positive integer is realizable. Our methods are effective: We prove that if $q \leq 5$, then every positive integer is realizable, and for arbitrary q , every positive integer $\geq q^{3\sqrt{q}\log q}$ is realizable. This is joint work with Raymond van Bommel, Edgar Costa, Bjorn Poonen and Alexander Smith. (Received January 24, 2022)