Joseph H Silverman (jhs@math.brown.edu) and Bianca Viray* (bviray@math.brown.edu).

On a uniform bound for the number of exceptional linear subvarieties in the dynamical Mordell–Lang conjecture.

Let \( \phi : \mathbb{P}^n \to \mathbb{P}^n \) be a morphism of degree \( d \geq 2 \) defined over \( \mathbb{C} \). The dynamical Mordell–Lang conjecture says that the intersection of an orbit \( \mathcal{O}_\phi(P) \) and a subvariety \( X \subset \mathbb{P}^n \) is usually finite. We consider the number of linear subvarieties \( L \subset \mathbb{P}^n \) such that the intersection \( \mathcal{O}_\phi(P) \cap L \) is “larger than expected.” When \( \phi \) is the \( d^{th} \)-power map and the coordinates of \( P \) are multiplicatively independent, we prove that there are only finitely many linear subvarieties that are “super-spanned” by \( \mathcal{O}_\phi(P) \), and further that the number of such subvarieties is bounded by a function of \( n \), independent of the point \( P \) and the degree \( d \). More generally, we show that there exists a finite subset \( S \), whose cardinality is bounded in terms of \( n \), such that any \( n + 1 \) points in \( \mathcal{O}_\phi(P) \setminus S \) are in linear general position in \( \mathbb{P}^n \). (Received September 11, 2011)