# Dynamical analogues of the Mordell-Lang Conjecture and the Mumford gap principle

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**Abstract**

We prove a special case of a dynamical analogue of the classical Mordell-Lang conjecture. In particular, let $\phi$ be a rational function with no superattracting periodic points other than exceptional points. If the coefficients of $\phi$ are algebraic, we show that the orbit of a point outside the union of proper preperiodic subvarieties of $(P^1)^g$ has only finite intersection with any curve contained in $(P^1)^g$. The result can viewed a non-linear version of the Skolem-Mahler-Lech theorem (namely that the zero set of a linear recurrence set is eventually periodic.) Time permitting, we will also discuss the general case (e.g., $\phi$ having superattracting periodic points); in particular, showing very rapid rate of growth of indices in case the zero set is not periodic.