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Integer points in backward orbits. (English) Zbl 1246.37102
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Summary: A theorem of J. Silverman states that a forward orbit of a rational map $\varphi(z)$ on $\mathbb{P}^1(K)$ contains finitely many S -integers in the number field K when $(\varphi \circ \varphi)(z)$ is not a polynomial. We state an analogous conjecture for the backward orbits using a general S -integrality notion based on the Galois conjugates of points. This conjecture is proven for the map $\varphi(z) = z^d$, and consequently Chebyshev polynomials, by uniformly bounding the number of Galois orbits for $z^n - \beta$ when $\beta \neq 0$ is a non-root of unity. In general, our conjecture is true provided that the number of Galois orbits for $\varphi^n(z) - \beta$ is bounded independently of n .

MSC:

37P35 Arithmetic properties of periodic points
11S82 Non-Archimedean dynamical systems

Cited in **3** Reviews
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Keywords:

arithmetic dynamics; backward orbits; relative S -integrality; Galois orbits; Galois action on pre-images; dynamic Lehmer's conjecture

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