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On the compactness of Julia sets of p -adic polynomials. (Sur la compacité des ensembles de Julia des polynômes p -adiques.) (French) [Zbl 1047.37031](#)
Math. Z. 246, No. 1-2, 273-289 (2004).

It is easy to see that the Julia set of a polynomial dynamical system over \mathbb{C} is a compact subset of $\mathbb{P}^1(\mathbb{C})$. If one considers \mathbb{C}_p (the completion of an algebraic closure of the field of p -adic numbers) instead of \mathbb{C} , that is not necessarily so. The author shows that the compactness assumption imposes a strong restriction upon the dynamical system. In particular, if $J(P_0)$ is the Julia set of a polynomial P_0 of a degree ≥ 2 , and $J(P_0)$ is nonempty and compact, then all periodic points are repelling. In this case, the mapping $P \mapsto J(P)$ is continuous at P_0 with respect to the Hausdorff distance on the space of nonempty bounded closed subsets of $\mathbb{P}^1(\mathbb{C}_p)$.

Reviewer: [Anatoly N. Kochubei \(Kyiv\)](#)

MSC:

- [37F50](#) Small divisors, rotation domains and linearization in holomorphic dynamics
- [11S85](#) Other nonanalytic theory
- [37F10](#) Dynamics of complex polynomials, rational maps, entire and meromorphic functions; Fatou and Julia sets
- [37F35](#) Conformal densities and Hausdorff dimension for holomorphic dynamical systems

Cited in **9** Documents

Keywords:

p -adic polynomial dynamical system; Julia set; Fatou set; Hausdorff distance

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