

Parabolic Fatou components with holes

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Many examples of invariant non-recurrent Fatou components of automorphisms F of \mathbb{C}^2 arise from local projections to one variable in which the dynamics are approximately parabolic. After constructing a local basin B , a critical step is to show that the associated completely invariant global basin Ω of all orbits ending up in B is not just a proper subset of a Fatou component.

I will present two types of examples in which the initial projection is non-linear and the resulting Fatou component Ω is biholomorphic to $\mathbb{C} \times \mathbb{C}^*$, i.e. "has a hole". The constructions are based on the dynamics near a fixed point p on the boundary of U such that the eigenvalues of F at p are complex conjugate irrational rotations. For the first type, all orbits in Ω converge to p , whereas for the second type the orbits in Ω converge precisely to the points of an entire curve minus p .