

Triviality of fibers for Misiurewicz parameters in the exponential family

A.M.Benini

Oberwolfach, October 2008

Triviality of fibers for Misiurewicz parameters in the exponential family

Outline

- Misiurewicz parameters
- Fibers and rigidity
- Statement and sketch of proof

Misiurewicz parameters

$f_{c_0}(z) = e^z + c_0$ is **Misiurewicz** if

$$f^{k+m}(c_0) = f^m(c_0), \quad k \geq 1$$

Theorem

Schleicher, Zimmer

Any Misiurewicz parameter c_0 is landing point of finitely many preperiodic rays $G_{s_1} \dots G_{s_q}$, and the dynamic rays $g_{s_1} \dots g_{s_2}$ with the same addresses land at c_0 in Π_{c_0}

Other main properties

- $J(f_{c_0}) = \mathbb{C}$
- There exist a dynamical partition with respect to which rays have same itinerary iff they land together

Fibers and Rigidity

- Fibers
The fiber of a point z_0 in dynamical (parameter) space is the set of points z which cannot be separated from z_0 by a pair of periodic rays landing together
- Triviality of fibers
The fiber of z_0 is trivial if it only contains z_0 and the rays which might land at z_0
- Conjecture: *Fibers of non hyperbolic parameters are trivial*

⇓ (Rempe, Schleicher)

Density of hyperbolicity

Main theorem and proof outline

Theorem

Fibers of Misiurewicz parameters in parameter space are trivial

- 1 **Combinatorial approximation of parameter rays** We can approximate combinatorially the parameter rays landing at c_0
- 2 **Triviality of fibers in dynamical plane**
Dynamical fibers of the postcritical orbit are trivial
- 3 **Persistence of dynamical triviality**
Dynamical fibers of the analytic continuation of the postcritical orbit are trivial for any c in a parameter neighborhood of c_0