A family of rational maps with buried Julia components

SÉBASTIEN GODILLON

Laboratoire AGM / Dept. de Mathématiques
Université de Cergy-Pontoise
2, avenue Adolphe Chauvin
95 302 CERGY-PONTOISE CEDEX
FRANCE
E-mail address: sebastien.godillon@u-cergy.fr
URL: http://godillon.u-cergy.fr/

A Julia component is said buried if it has no intersection with the boundary of any Fatou domain. It is well known that may not arise for polynomial maps. The first example of such Julia components is due to Curtis McMullen [1] who provided a family of rational maps for which the disconnected Julia set is a Cantor of Jordan curves. However all known examples of buried Julia components, up to now, are wandering Jordan curves and comes from rational maps of degree at least 5.

I will introduce a family of degree 3 rational maps whose disconnected Julia set contains buried Julia components of all types which may occur a priori according to a result of Kevin Pilgrim and Tan Lei [2]: wandering points, wandering Jordan curves but also preperiodic infinitely connected Julia components. That totally answers a question McMullen raised since 3 is the minimal degree expected for rational map with buried Julia components [3].

References

[1] Curtis McMullen, *Automorphisms of rational maps*, Holomorphic Functions and Moduli, 1:31-60, 1988.

[2] Kevin Pilgrim and Tan Lei, *Rational maps with disconnected Julia set*, Astérisque, 261:349-384, 2000.

[3] John Milnor, *Remarks on quadratic rational maps*, Experimental Mathematics, 1:5-24, 1992.