

On McMullen-like mappings

TONI GARIJO

Departament d'Enginyeria Informàtica i Matemàtiques, Universitat Rovira i Virgili, Tarragona, Spain

We introduce a generalization of particular dynamical behavior for rational maps. In 1988, C. McMullen showed that the Julia set of $f_\lambda(z) = z^n + \lambda/z^d$ for $|\lambda| \neq 0$ small enough is a Cantor set of circles if and only if $1/n + 1/d < 1$ holds. Several other specific singular perturbations of polynomials have been studied in recent years, all have parameter values where a Cantor set of circles is present in the associated Julia set. We unify these examples by defining a McMullen-like mapping as a rational map f associated to a hyperbolic postcritically finite polynomial P and a pole data \mathcal{D} where we encode the location of every pole of f and the local degree at each pole. As for the McMullen family f_λ , we characterize a McMullen-like mapping using an arithmetic condition depending only on (P, \mathcal{D}) . We show how to check the definition in practice providing new explicit examples of McMullen-like mappings for which a complete topological description of their Julia sets is made.