

Perturbed Polynomial Maps with Small Perturbation

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We consider the family of rational maps $F_\lambda(z) = z^n + \frac{\lambda}{z^n}$ with $\lambda \in \mathbb{C}$. For $n > 2$, Julia sets for maps corresponding to parameters near the origin are Cantor sets of simple closed curves. For $n = 2$, however, as λ approaches zero, it is known that the Julia sets for these maps converge to the closed unit disc in the Hausdorff metric. In this talk, we give a description of a "ring structure" in the parameter plane for $n = 2$ near $\lambda = 0$, identifying a pattern of rings of alternating Sierpiński holes and Mandelbrot sets surrounding the origin.