Pullback Laminations for Julia Sets of Hyperbolic Complex Polynomials

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The Julia set of a complex polynomial of degree $d \geq 2$ is a fully invariant subset of the complex plane under iteration of the polynomial. It is the fractal set of points on which the polynomial is "chaotic." Laminations of the unit disc consist of non-crossing chords, called leaves, and are a topological, geometric, and combinatorial way to study the connected Julia sets of polynomials. We will discuss how to determine its corresponding lamination given a polynomi al Julia set, via a version of the Riemann Mapping Theorem and external rays. More to the point, we will show how to find interesting hyperbolic laminations (all criticality is in Fatou gaps), show that a polynomial exists whose Julia set has that lamination, and explore ways to determine specific polynomials that have that lamination. The latter route, from lamination to polynomial, begins with defining a "pullback lamination" given initial data about the behavior of periodic leaves and criticality.