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LOCALLY CONNECTED MODELS FOR JULIA SETS OF POLYNOMIALS

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Let $P : \mathbb{C} \rightarrow \mathbb{C}$ be a polynomial of degree d with connected Julia set J . A *locally connected model* of $P|_J$ is a dynamical system $P_\sim : J_\sim \rightarrow J_\sim$ on a locally connected continuum J_\sim to which $P|_J$ is monotonically semiconjugate. Jan Kiwi (2004) constructed non-degenerate (i.e., not the identity map on a point) locally connected models for polynomials P without irrationally neutral periodic points, and showed in that case that the locally connected model J_\sim comes from a finite-to-one map $\Phi : \mathbb{S}^1 \rightarrow J_\sim$ which semiconjugates $z \mapsto z^d$ to P_\sim .

We extend Kiwi's work to all polynomials with connected Julia set. We prove that there is a *finest* locally connected model of $P|_J$, and that the semiconjugacy is the finest monotone map of J to any locally connected continuum. (By a finest monotone map of J to any locally connected continuum, we mean a map m of J onto a locally connected continuum such that any other monotone map m' of J onto a locally connected continuum is a composition of m with another monotone map.) We characterize the models and their associated laminations, and characterize dynamically when the finest locally connected model is non-degenerate.

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