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Thursday, June 10th, 11:15-12:00 EDT.

Title: Pointwise Dimension of Bifurcation Measures and Critical Exponent of the Free Energy

Abstract: Let $f : \mathbb{D} \times \mathbb{P}^1 \to \mathbb{P}^1$ be a holomorphic family of rational maps of degree d, and let $a : \mathbb{D} \to \mathbb{P}^1$ be a holomorphic map which we call a marked point. Associated with a is the activity/bifurcation measure μ. Suppose $\lambda_0 \in \mathbb{D}$ is a parameter such that $a(\lambda_0)$ is pre-periodic to a repelling cycle under f_{λ_0} with multiplier η_0. Under a mild assumption we show that the pointwise dimension of μ at λ_0, defined by

$$\lim_{\epsilon \to 0} \frac{\log \mu(\mathbb{D}_\epsilon(\lambda_0))}{\log \epsilon},$$

is equal to $\frac{\log d}{\log|\eta_0|}$. We then discuss a potential application of this result in statistical mechanics, specifically about the critical exponent of the free energy for the Ising/Potts models.