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Multifractal analysis for multimodal maps

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Let $f : I \to I$ be a C^3 map of the interval I with critical points. Given an equilibrium state μ_ϕ for a Hölder potential $\phi : I \to \mathbb{R}$, the local dimension $d_{\mu_\phi}(x)$ measures how concentrated μ_ϕ is at this point. The dimension spectrum encodes the Hausdorff dimension of level sets of d_{μ_ϕ}. This spectrum can be understood via induced maps (X, F), where $F = f^\tau$ for some inducing time τ. A major challenge for maps with critical points is to find inducing schemes which 'see' a sufficiently large subset of the space. In this talk I will explain how this problem can be overcome, and hence that the dimension spectrum is encoded by a function related to the pressure of some potentials involving ϕ. These results apply to Collet-Eckmann maps, as well as to maps with weaker growth conditions.