

Rough Weierstrass curves as attractors: SBR measure and local time

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Abstract

We investigate geometric properties of Weierstrass curves with one or two components, representing series based on trigonometric functions. They are Hölder continuous, and not (para-)controlled with respect to each other. They can be embedded into a smooth dynamical system, where their graph emerges as a pullback attractor. Each one-dimensional component of the curve may also be seen in the light of this dynamical system. It turns out that occupation measures and SBR measures on its stable manifold are dual to each other, via time reversal. A suitable version of self affinity for deterministic functions yields scaling properties for the measures, telescoping microscopic to macroscopic properties. As a consequence, absolute continuity of the SBR measure is obtained, as well as the existence of a local time. The link between rough Weierstrass curves and smooth dynamical systems can be generalized considerably. Applications to regularization of singular ODE by rough (Weierstrass type) signals are on our agenda. This is joint work with G. dos Reis (U Edinburgh) and O. Pamen (U Liverpool and AIMS Ghana).