ε-neighbourhoods of orbits and formal classification of parabolic diffeomorphisms

(Talk)

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I will talk about local discrete dynamics generated by parabolic diffeomorphisms $f : \mathbb{C} \to \mathbb{C}$ tangent to identity with fixed point at the origin. Precisely, I show how formal classification of a given parabolic diffeomorphism can be deduced from two coefficients in formal asymptotic development of the $\varepsilon-$neighbourhood of one of its orbits near the origin, without making the usual change of variables which lead to formal normal form. On the other hand, relevant coefficients and constants are not without the geometric meaning: they present fractal properties of the orbit, namely its box dimension, Minkowski content and so called residual content. The results can be applied to formal classification of complex saddles using their holonomy maps, which, under some assumptions on the saddle, turn out to be parabolic diffeomorphisms.

MSC2010: 30D05, 37C45.

Keywords: complex parabolic diffeomorphisms, Box dimension, Minkowski content, formal normal form.

Section: Ordinary Differential Equations and Dynamical Systems.

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