

FRACTAL ANALYSIS OF PLANAR NILPOTENT SINGULARITIES

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The goal of our work is to give a complete fractal classification of planar analytic nilpotent singularities. For the classification, we use the notion of box dimension of (two-dimensional) orbits on separatrices generated by the unit time map. We also show how the box dimension of the one-dimensional orbit generated by the Poincaré map, defined on the characteristic curve near the nilpotent center/focus, reveals an upper bound for the number of limit cycles near the singularity. We introduce simple formulas for numerical calculation of the box dimension of one- and two-dimensional orbits and apply them to nilpotent singularities.

Joint work with: Lana Horvat Dmitrović, Renato Huzak and Domagoj Vlah.