

1147-34-107

**Domagoj Vlah\*** (domagoj.vlah@fer.hr), **Darko Žubrinić** and **Vesna Županović**. *Fractal properties of a class of polynomial planar systems.*

We study a class of polynomial planar systems with a singularity at the origin of degenerate focus type and without characteristic directions. This class is obtained using a simple transformation of a class of systems having weak foci, which is related to the normal form for the Hopf-Takens bifurcation. The class is given by

$$\begin{aligned}\dot{x} &= -y^{2n-1} \pm x^n y^{n-1} (x^{2n} + y^{2n})^k \\ \dot{y} &= x^{2n-1} \pm x^{n-1} y^n (x^{2n} + y^{2n})^k,\end{aligned}$$

where parameters  $k, n \in \mathbb{N}$ .

For this class we show that the box dimension of any spiral trajectory  $\Gamma$  is nontrivial and

$$\dim_B \Gamma = 2 \left( 1 - \frac{1}{2nk + 1} \right).$$

Also, we show the connection to the previous work done by Darko Žubrinić and Vesna Županović, regarding fractal analysis of spiral trajectories near the origin of a system

$$\begin{cases} \dot{x} = -y + p(x, y) \\ \dot{y} = x + q(x, y), \end{cases}$$

where  $p(x, y)$  and  $q(x, y)$  are analytic functions with all terms of degree 2 or more. (Received December 18, 2018)