

CENTER-FOCUS PROBLEM BY ITS COMPLEX SEPARATRICES

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In this work we deal with analytic families of real planar vector fields \mathcal{X}_λ having a monodromic singularity at the origin for any $\lambda \in \Lambda \subset \mathbb{R}^p$ and depending analytically on the parameters λ . There naturally appears the so-called center-focus problem which consists in describing the partition of Λ induced by the centers and the foci at the origin. We give a characterization of the centers (degenerated or not) in terms of a specific integral of the cofactor associated to a real invariant analytic curve passing through the singularity, which always exists. Several consequences and applications are also stated.