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Qualitative Theory of Dynamical Systems

Global Configurations of Singularities for Quadratic Differential Systems with Total Finite Multiplicity Three and at Most Two Real Singularities

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Abstract In this work we consider the problem of classifying all configurations of singularities, finite and infinite, of quadratic differential systems, with respect to the *geometric equivalence relation* defined in Artés et al. (Rocky Mount J Math, 2014). This relation is deeper than the *topological equivalence relation* which does not distinguish between a focus and a node or between a strong and a weak focus or between foci of different orders. Such distinctions are however important in the production of limit cycles close to the foci in perturbations of the systems. The notion of *geometric equivalence relation* of configurations of singularities allows us to incorporate all these important geometric features which can be expressed in purely algebraic terms. This

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