PSI-SERIES OF QUADRATIC VECTOR FIELDS ON THE PLANE

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Abstract

Psi-series (i.e., logarithmic series) for the solutions of quadratic vector fields on the plane are considered. Its existence and convergence is studied, and an algorithm for the location of logarithmic singularities is developed. Moreover, the relationship between psi-series and non-integrability is stressed and in particular it is proved that quadratic systems with psi-series that are not Laurent series do not have an algebraic first integral. Besides, a criterion about non-existence of an analytic first integral is given.