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The Poincaré Center Problem for Simple Analytic Monodromic Singularities

In this work we present an alternative algorithm for computing Poincaré–Liapunov constants of simple monodromic singularities of planar analytic vector fields based on the concept of inverse integrating factor, see for instance [1, 2]. Simple monodromic singular points are those for which after performing the first (generalized) polar blow–up, there appear no singular points. In other words, the associated Poincaré return map is analytic. An improvement of the method determines a priori the minimum number of Poincaré–Liapunov constants which must cancel to ensure that the monodromic singularity is in fact a center when the explicit Laurent series of an inverse integrating factor is known in (generalized) polar coordinates.

- [1] I.A. García, H. Giacomini and M. Grau, *The inverse integrating factor and the Poincaré map*, Trans. Amer. Math. Soc., to appear. [arXiv:0710.3238v1](#) [math.DS]
 - [2] I.A. García, H. Giacomini and M. Grau, *Generalized Hopf bifurcation for planar vector fields via the inverse integrating factor*. [arXiv:0902.0681v1](#) [math.DS]
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