



## The period function of a family of analytic centers

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Consider a planar family of planar differential systems with a center at  $p$ . The period function assigns to each periodic orbit in the period annulus its period. The problem of bifurcation of critical periods have been studied and there are three different situations to consider: bifurcations from the center, bifurcations from the interior of the period annulus and bifurcation from the outer boundary of the period annulus. The bifurcation of critical periods from the inner boundary is completely understood thanks to C. Chicone and M. Jacobs. In this work we study the bifurcation of critical periods for the family of potential systems  $X_{p,q} = -ydx + V_{p,q}(x)dy$  with  $V_{p,q}(x) = (x+1)^p - (x+1)^q$ . This family has a center at  $x = 0$  for all  $p > q$ . We study monotonicity, isochronicity and bifurcation of critical periods from the center and from the interior of the period annulus. Moreover some new techniques are presented concerning the bifurcation from the outer boundary for potential systems.

### Referencias

- [1] F. Mañosas and D. Rojas and J. Villadelprat: Study of the period function of a biparametric family of centers, *Preprint* (2015).
- [2] F. Mañosas and D. Rojas and J. Villadelprat: On the criticality of centers of potential systems at the outer boundary, *Preprint* (2015).

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