

# Numerical computation of rotation numbers for quasi-periodic planar curves

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## Abstract

Recently, a numerical method to compute rotation numbers of circle diffeomorphisms with high accuracy was introduced (see [1]). In order to apply the method in the study of invariant curves of planar maps, one requires the curve to define an analytic (or smooth) circle map, which in the ideal case is obtained by projection of the curve into a circle. For instance, this parameterization is always possible for maps satisfying the so called “twist condition”. In this work we extend the methodology including those cases in which this condition fails. As a paradigmatic example, we discuss meandering phenomena in nontwist maps (see [2]). Other examples and further generalizations are also studied.

## References

- [1] T.M. Seara and J. Villanueva. On the numerical computation of Diophantine rotation numbers of analytic circle maps. Preprint <http://www.ma1.upc.edu/recerca/2004-2005.html>
- [2] C. Simó. Invariant curves of analytic perturbed nontwist area preserving maps. Regul. Chaotic Dyn. 3 (1998), no. 3, 180–195.