

Geometry and bifurcation structure of resonances in two-parameter dissipative systems

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Abstract

We derive the minimum geometric structure of the bifurcation diagram near a resonance for weak coupling of the unfolding of a saddle-node of periodic orbits for a flow to an oscillator. This extends the theory of Chenciner bubbles to a global context.

In the second part we do the same for families of three weakly coupled oscillators, justifying some conjectures of [BGKM1, BGKM2].

References

- [BGKM1] C. Baesens, J. Guckenheimer, S. Kim and R.S. MacKay, *Three coupled oscillators: mode-locking, global bifurcations and toroidal chaos*, *Physica D* **49** (1991) 387–475.
- [BGKM2] C. Baesens, J. Guckenheimer, S. Kim and R.S. MacKay, *Simple resonance regions of torus diffeomorphisms*, in “Patterns and Dynamics in Reactive Media” (Proceedings, IMA, Minneapolis, 1989), eds R. Aris, D.G. Aronson, H.L. Swinney, IMA Vol. in Maths and its Applications 37, Springer (1991) 1–9.