FRACTIONAL MONODROMY AND SEIFERT MANIFOLDS

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Abstract

The notion of fractional monodromy was introduced in [4] in the specific example of a two degree of freedom integrable Hamiltonian system. It generalizes the notion of standard monodromy in the sense of Duistermaat from torus bundles to singular torus fibrations. Since the pioneering work [4] fractional monodromy was computed for several integrable Hamiltonian systems, though a general result that would allow to define and compute fractional monodromy has been missing.

We prove that in the presence of a Hamiltonian circle action fractional monodromy is well defined and can be computed in terms of the fixed points of the action. Surprisingly, the proofs are based only on topological properties of certain compact 3-manifolds, which are called Seifert manifolds. We will focus on these properties during the talk.

This is a report on a joint work with K. Efstathiou. We were inspired by the ideas presented in [1], [2] and [3].

References

1. M. Audin, *Torus actions on symplectic manifolds*, Birkhäuser, 2004.
2. K. Efstathiou and H. W. Broer, *Uncovering fractional monodromy*, Communications in Mathematical Physics **324** (2013), no. 2, 549–588.
3. K. Efstathiou and N. Martynchuk, *Monodromy of Hamiltonian systems with complexity-1 torus actions*, submitted (2016).
4. N.N. Nekhoroshev, D.A. Sadovskií, and B.I. Zhilinskií, *Fractional Hamiltonian monodromy*, Annales Henri Poincaré **7** (2006), 1099–1211.

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