

Topology of non-compact integrable Hamiltonian systems: first steps

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The theory of topological invariants for Liouville integrable Hamiltonian systems created by A. T. Fomenko and his school [1-3] allows to investigate the topology of the corresponding Liouville foliations and the spaces of trajectories of such systems in the compact case (i.e. when all the leaves of the Liouville foliation are compact). However there exist many natural examples of integrable systems with non-compact Liouville foliations. In the talk we discuss first attempts to generalize the Fomenko theory for non-compact integrable systems. First of all, we focus on the most simple case: Hamiltonian systems with one degree of freedom. Every such system is Liouville integrable, since its Hamiltonian function suffices for integrability. Under some conditions these systems can be easily classified up to topological equivalence in the terms similar to those in the compact case. At the same time, in the problem of classification of such systems up to conjugacy some new effects appear.

- [1] Fomenko AT, Zieschang H. A topological invariant and a criterion for the equivalence of integrable Hamiltonian systems with two degrees of freedom. *Izvest. Akad. Nauk SSSR, Ser. Matem.* 1990; 54(3): 546-575 (in Russian).
 - [2] Bolsinov AV, Fomenko AT. Orbital equivalence of integrable Hamiltonian systems with two degrees of freedom. A classification theorem. I, II. *Matem. Sbornik.* 1994; 185(4): 27-80; 185(5): 27-78 (in Russian).
 - [3] Bolsinov AV, Fomenko AT. *Integrable Hamiltonian Systems. Geometry, Topology, Classification.* Chapman & Hall/CRC, Boca Raton. 2004.
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