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The Maslov cocycle, smooth structures and real-analytic complete integrability

In this talk, I will discuss two main results. First, I show that if the cotangent bundle of a smooth manifold homeomorphic to the standard n-torus admits a real-analytically completely integrable convex hamiltonian, then the manifold is diffeomorphic to the standard n-torus. Second, I prove that for some topological 7-manifolds, the cotangent bundle of each smooth structure admits a real-analytically completely integrable riemannian metric hamiltonian.

This proves that the existence of a real-analytically completely integrable convex hamiltonian is a non-trivial smooth invariant of a manifold.