

# Semifree Hamiltonian Circle Actions on 6-dimensional Symplectic Manifolds with Non-isolated Fixed Point Set

Mucahit MERAL

Middle East Technical University, Ankara, Turkey  
mucahit@metu.edu.tr

## Abstract

Let  $(M^{2n}, w)$  be a  $2n$ -dimensional closed symplectic manifold with a symplectic  $S^1$  action. Many mathematicians tried to find some conditions on  $M$  which make a symplectic circle action Hamiltonian. Cho, Hwang and Suh discovered a condition on the 6-dimensional symplectic manifolds. In this talk, we will discuss CHS's theorem: Let  $(M, w)$  be a 6-dimensional closed symplectic  $S^1$ -manifold with generalized moment map  $\mu : M \rightarrow S^1$ . Assume that the fixed point set is not empty and dimension of each component at most is 2. Then the action is Hamiltonian if and only if  $b_2^+(M_\xi) = 1$  for any regular value  $\xi$  of  $\mu$ .

**Keywords.** Symplectic manifolds, Hamiltonian action, reduced space

## References

- [1] Y. Lin, **The log-concavity conjecture for the Duistermatt-Heckman measure revisited**, Int. Math. Res. Not., (2008), no.10, Art. ID rnn027, 19pp.
- [2] V. Guillemin, E. Lerman and S. Sternberg, **On the Kostant multiplicity formula**, J. Geom. Phys., 5(1998), 721-750.
- [3] Y. Choo, T. Hwang and D. Y. Suh, **Semifree Hamiltonian Circle Actions on 6-dimensional Symplectic Manifolds with Non-isolated Fixed Point Set**, <https://arxiv.org/abs/1005.0193>