

Homework 7. October 11, 2021.

1. (a) Suppose the Lie group G acts properly on the manifold M . Then show that the quotient topology on the orbit space M/G is Hausdorff.
(b) Give an example of a group action that is not proper, and for which the orbit space is not Hausdorff.
2. Let $T = (S^1)^n$ be a torus, and let (M, ω, T, μ) be a Hamiltonian T -space. Show that any T -orbit is an isotropic submanifold.
3. In class, we computed the moment map for the action of $(S^1)^2$ on \mathbb{P}^2 . What is the image of the moment map? Classify the level sets by diffeomorphism type.