

Juan Carlos Marrero

Universidad de La Laguna (Tenerife, I Canarias, España), España
jcmarrer@ull.edu.es

In the first part of this talk, I will present some motivating examples, for Geometry and Physics, of homogeneous presymplectic Hamiltonian systems. These systems consist of the following objects: i) a principal $\mathbb{R}^\times$ -bundle with total space $\tilde{C}$ and base space C , where $\mathbb{R}^\times = \mathbb{R}^+$ or $\mathbb{R}^\times = \mathbb{R} - \{0\}$; ii) a homogeneous presymplectic structure on $\tilde{C}$, which is the differential of a horizontal homogeneous 1-form on $\tilde{C}$ and iii) a homogeneous Hamiltonian function on $\tilde{C}$.

In the second part of the talk, we will prove that from a homogeneous presymplectic Hamiltonian system on $\tilde{C}$ one may construct a homogeneous presymplectic Hamiltonian system on C with values in a line bundle L over C . The solutions of this last system are not curves on C , but curves of derivations on L .

Then, in the last part of the talk, we will see that there exists a one-to-one correspondence between the solutions of both systems. In the particular case when the principal $\mathbb{R}^\times$ -bundle is trivial and the presymplectic structure on $\tilde{C}$ is non-degenerate then the previous construction is just the reduction of homogeneous symplectic Hamiltonian systems to contact Hamiltonian systems and we recover an old construction due to Arnold.

Trabajo en conjunto con The results in the talk are contained in a paper (in progress) in collaboration with J Fernandez (Instituto Balseiro, Argentina), S Grillo (Instituto Balseiro, Argentina) and E Padron (ULL, Spain)..