Towards contact semitoric systems

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Traditionally, Hamiltonian systems have been studied in the context of symplectic manifolds, which are always even dimensional. This means that on odd dimensional manifolds, we cannot use the framework of Hamiltonian dynamics. To overcome this fact, a Hamiltonian formalism was also introduced for contact geometry, which can be seen as the odd-dimensional sibling of symplectic geometry. Over the years, many results from symplectic Hamiltonian dynamics were translated to the contact world.

In this talk, we will start with a comparison between symplectic and contact Hamiltonian dynamics. We will see how contact completely integrable systems are defined. Furthermore, we will compare symplectic toric systems as classified by Delzant and contact toric systems as classified by Lerman.

The next step should be a comparison between semitoric systems in the symplectic and contact sense. However, this last notion has not yet been defined. Before any attempts should be made to define such a class of systems, it is important to find examples of non-toric contact systems which are reasonable enough to classify. In the second part of this talk, I will give an overview of my attempts to construct a non-toric contact system from a symplectic semitoric system. This bottom-up approach would imply that some properties of symplectic semitoric systems might be inherited by contact semitoric systems.