

Families of (hyper)semitoric systems

Yohann Le Floch

IRMA, Université de Strasbourg

A semitoric system is a four-dimensional integrable system whose momentum map has a component generating an effective S^1 -action and possesses mild singularities. These systems have been classified a few years ago by Pelayo and Vũ Ngọc (for the generic case) and later by Palmer, Pelayo and Tang (for the fully general case), thanks to several invariants; however, the construction of a system with given invariants involves symplectic gluing of some local normal forms. My goal will be to review these notions and to explain some attempts to answer the following broad question: can one construct a fully explicit (i.e. whose momentum map is given by global explicit formulas) semitoric system with a given partial list of invariants in a relatively simple way? I will discuss some results that this seemingly naive question led to, and in particular I will mention more general systems with S^1 -symmetry called hypersemitoric systems. This is based on past and ongoing work with Joseph Palmer (University of Illinois Urbana-Champaign).