Explicit Compact Semitoric Integrable Systems

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Abstract

Semitoric integrable systems are a special class of 4-dimensional integrable systems for which the first component of the momentum map generates a global S^1-action. These systems were classified by Pelayo-Vũ Ngọc in 2011 in terms of five invariants. Given a collection of invariants, the work of Pelayo-Vũ Ngọc explicitly constructs the associated semitoric system by gluing together certain local normal forms of the fibers. In this talk we report on efforts to produce explicit global formulas (defined by the same expression on the entire manifold) for semitoric systems after specifying a partial list of invariants. In particular, we search for systems with a given *semitoric polygon invariant* and also introduce a family of systems which have two singular points of *focus-focus* type. These examples should be useful for understanding semitoric systems in a concrete, computationally amenable, context. Portions of this work are joint with S. Hohloch and Y. Le Floch.