Tensor invariants of Hamiltonian systems

A.V. Tsiganov (*Saint Petersburg State University*, *Saint Petersburg*)

The integrability of a system of differential equations is closely related to the possibility of finding independent tensor invariants of that system. Such invariants include phase space functions (first integrals), vector fields (symmetry fields), and differential k-forms (generating k-dimensional integral invariants). According to the Euler-Jacobi, Lie, Arnold-Liouville and Kozlov theorems on integrability by quadratures, there exists a set of decomposable invariant differential forms and multivector fields in a neighborhood of a compact integral manifold with the properties prescribed by these theorems. By imposing additional conditions on these invariant objects, for instance an equality of the Schouten-Nijenhuis bracket or Frölicher-Nijenhuis bracket between them to zero, one can obtain various deformations of the canonical Poisson structures, which were discussed by Flashka, Marsden, Bogoyavlensky, Damianou, etc. In this talk we plan to discuss globally defined indecomposable tensor invariants for Hamiltonian integrable and non-integrable systems on symplectic manifolds.