Poisson–Lie analogues of spin Sutherland models

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Abstract

We report on generalizations of those spin Sutherland models that descend by Poisson reduction from the Hamiltonian systems defined by the kinetic energy of the bi-invariant Riemannian metric on a compact semi-simple Lie group. The systems of interest are obtained by reducing the 'master integrable systems' on Heisenberg doubles representing the natural Poisson–Lie counterparts of the systems of free motion modeled on the cotangent bundles. We will demonstrate the degenerate integrability of the reduced systems after restriction to a dense open part of the Poisson quotient. The pertinent subset of the reduced phase space corresponds to restriction to the principal orbit type regarding the G-actions both on the Heisenberg double and on a dense open subset of the 'space of constants of motion'. Degenerate integrability on the generic symplectic leaves of the restricted Poisson quotient will also be proven. In addition, two characterizations of the reduced Poisson structure will be presented, the first one incorporates a dynamical r-matrix, while the second one utilizes variables consisting of canonical pairs and decoupled generalized spin variables underlying the interpretation of the reduced systems as Ruijsenaars–Schneider type deformations of the spin Sutherland models.

Similar results on the integrable systems that result from reductions of the internally fused quasi-Poisson doubles will be outlined at the end of the talk.

References

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