

**Poisson structure on meromorphic functions defined on
Riemann surfaces and classical integrable models
K.L. Vaninsky, Michigan State U.**

In 1988 Atiyah and Hitchin introduced a Poisson bracket (PB) on meromorphic functions defined on the Riemann sphere. Can one replace the Riemann sphere by a Riemann surface of genus $g > 0$? We present one such generalization which is based on the theory of completely integrable systems.

The periodic problem for the Korteweg de Vries equation, the cubic nonlinear Schrodinger equation and the like is solved by methods of algebraic geometry. Novikov, Veselov and Dubrovin in 1982 singled out a class of PB for these equations. They call these brackets analytic PB compatible with algebraic geometry. A systematic theory of analytic PB is still lacking.

Introducing the Weyl function defined on a Riemann surface we obtain a new analytic formula for the basic PB for the KdV and NLS. We call this bracket the deformed Atiyah–Hitchin bracket. We explain connection of our result with the classical Yang–Baxter equation and discuss some open problems.