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Algebraic Nijenhuis operators anmd Kronecker Poisson pencils

Abstract:

We give a criterion of (micro-)kroneckerity of the linear Poisson pencil on $\mathfrak{g}^*$ related to an algebraic Nijenhuis operator $N : \mathfrak{g} \to \mathfrak{g}$ on a finite-dimensional Lie algebra $\mathfrak{g}$. As an application we get a series of examples of completely integrable systems on semisimple Lie algebras related to Borel subalgebras and a new proof of the complete integrability of the free rigid body system on $\mathfrak{gl}_n$.