

Scientific report on the short visit at TU Berlin,
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During this short visit I had an opportunity to discuss with Prof. A. Bobenko (TU Berlin) and participants of the MISGAM meeting "Geometry and Integrability" which was held in Berlin on June 3-7.

The main topic of the discussions was the possibility of generalizing the results of my paper "Algebraic Nijenhuis operators and Kronecker Poisson pencils" (<http://xxx.lanl.gov/abs/math.DG/0504337>) to the more general situation. Roughly, these results consists in the following.

Given an algebraic Nijenhuis operator $N : \mathfrak{g} \rightarrow \mathfrak{g}$, where \mathfrak{g} is a Lie algebra, one studies necessary and sufficient conditions under which the corresponding pencil of Lie-Poisson structures on \mathfrak{g}^* is Kronecker in the sense of Zakharevich. In particular this study allows to construct completely integrable systems on \mathfrak{g}^* .

As a result of the discussions the following preliminary result is obtained. Assume $N : T(G/K) \rightarrow T(G/K)$ is a left invariant geometric Nijenhuis operator on a homogeneous space G/K . Then there is a cotangent lift N^* of N to the cotangent bundle $T^*(G/K)$, which again will be left invariant and Nijenhuis. This gives rise to a Poisson pencil on $T^*(G/K)$ generated by the symplectic forms ω and $N^* \circ \omega$, where ω is the canonical one, and to the reduced Poisson pencil on $T^*(G/K)/G$. The result obtained gives the necessary and sufficient conditions on the Kroneckerity of this last pencil. Possible applications of this result consist in constructions of completely integrable systems on $T^*(G/K)$.

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