Graduate

SEMINARIO DE ÁLGEBRA

Decompositions of loop algebras and Lax representations

Vladimir Sokolov
UFABC, São Paulo

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Abstract. The modern integrability theory for non-linear differential equations is based on the concept of Lax representation. We consider different types of Lax representations. From the algebraic view-point a Lax representation for PDEs is defined by a decomposition of the loop algebra $G((\lambda))$ over a simple Lie algebra G into a direct sum of two vector spaces being Lie subalgebras. In the standard situation one of them is the subalgebra of Tailor series from $G((\lambda))$ and another is the co-called factoring subalgebra. We consider main examples of factoring subalgebras and the corresponding integrable models.