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Mathematics Colloquium

Nijenhuis operators on pre-Lie algebras

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Abstract

First we use a new approach to give a graded Lie algebra whose Maurer-Cartan elements characterize pre-Lie algebra structures. Then we define Nijenhuis operators on a pre-Lie algebra using this graded Lie bracket. Similar as the Lie algebra case, Nijenhuis operators on a pre-Lie algebra generate trivial deformations of this pre-Lie algebra. The notion of a pseudo-Hessian-Nijenhuis structure is introduced, which could give rise to a sequence of pseudo-Hessian and pseudo-Hessian-Nijenhuis structures. We introduce the notion of a para-complex quadratic pre-Lie algebra and show that it is the underlying structure of a para-Kähler Lie algebra. Finally, we study Nijenhuis operators on pre-Lie algebras that come from classical Yang-Baxter operators, integrable Burgers equations, Rota-Baxter algebras and Novikov algebras.

Thursday, 19 October 2017, 4pm

Smith Hall 204

Tea and refreshments will be served at 3:45pm.