

General Mathematics Seminar
of the
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Campus Kirchberg, Room B02

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An unabelian version of the L -infinity structure construction by T. Voronov.

Abstract: In 2005 T. Voronov gave a rather useful explicit construction of an L -infinity structure on a graded vector space V which can be seen as an abelian subalgebra complementing a subalgebra H in a graded Lie algebra G which he extended to the ambient Lie algebra G . His technique gave rise to some L -infinity constructions attached to coisotropic submanifolds and the deformation of morphisms of an associative or Lie algebra (work of Y. Frégier et al.). We generalize his construction to an L -infinity structure on the quotient G/H (and the extension) without assuming that there is an abelian subalgebra complement to H in G . The construction simplifies a bit to some “graded dressing transformation” if there is a (non)abelian subalgebra complement. The main idea is the observation that the quotient $U(G)/(U(G)H)$ of the universal enveloping algebra $U(G)$ of G is a cofree coalgebra on which G acts from the left by coderivations. This quotient had recently been studied in the trivially graded case by Calaque, Caldararu and Tu: using their result we can show that the generalized Voronov L -infinity structure is isomorphic just to a differential (no higher brackets) iff the (graded) Atiyah (or Nguyen-van Hai) class of the Lie algebra pair (G, H) vanishes. We shall indicate how the generalization may help to the quantization problem of coisotropic submanifolds as modules.