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Enveloping Algebras.*

The deformed enveloping algebra of a semisimple Lie algebra is usually defined by generators and relations. Part of these relations describe the commutation relations between the three subalgebras appearing in the triangular decomposition, whereas the remaining part, the so-called deformed Serre relations, describe these subalgebras themselves.

In his book on the subject, G. Lusztig uses a different approach to the deformed Serre relations: He derives them as the consequence of the nondegeneracy of a certain bilinear form. In this way, he obtains a description of two of the three subalgebras appearing in the triangular decomposition that is not based on generators and relations; the third subalgebra is just the group ring of an abelian group.

However, it is possible to give a construction of deformed enveloping algebras without any reference to relations. For this, one has to note that, although the subalgebras described by the deformed Serre relations are not Hopf subalgebras, they are Yetter-Drinfel'd Hopf algebras over the above-mentioned group ring, and there is a universal construction that yields the deformed enveloping algebra when applied to this Yetter-Drinfel'd Hopf algebra. In the talk, we explain the details of this construction. (Received August 23, 2011)