Koszul algebras and distributive triples

Lutz Hille

Let A be a \mathbb{Z} -graded quadratic algebra. Then we can define the quadratic dual algebra $A^!$ and the graded dual B of $A^!$. The Koszul complex $B \otimes A$ (with its canonical differential and a natural grading) is a complex of left projective A-modules. The algebra A is called Koszul, if the Koszul complex is a resolution of the semisimple A-module $A/A_{\geq 1}$. There is a result relating the the Koszul complex to certain triples of vector spaces associated to the algebra A. We formulate this result and derive several consequences. In particular, we obtain a new characterisation of Koszul algebras in terms of distributive triples of vector spaces.