

Séminaire d'algèbre, géométrie et topologie
Jeudi 8 juin à 14h
Salle I

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*On the exterior algebra of a simple Lie algebra \mathfrak{g}
as a representation of \mathfrak{g}*

I will survey some classical results of Hopf-Samelson-Koszul and Kostant on the exterior algebra of a simple Lie algebra \mathfrak{g} viewed as a representation of \mathfrak{g} . Then we will describe the space of invariants $A = (\Lambda\mathfrak{g} \otimes \mathfrak{g})^{\mathfrak{g}}$ (which is the isotypic component of type \mathfrak{g} in $\Lambda\mathfrak{g}$) as a module over the algebra of invariants $(\Lambda\mathfrak{g})^{\mathfrak{g}}$. As main result (joint with C. De Concini and C. Procesi) we prove that A is a free module, of rank twice the rank of \mathfrak{g} , over the exterior algebra generated by all primitive invariants in $(\Lambda\mathfrak{g})^{\mathfrak{g}}$ with the exception of the one of highest degree.

We will also discuss recent developments, such as a conjectural result on a natural Lie superalgebra structure on A and connections with a conjecture of Reeder on covariants of small representations. These latter topics are part of a joint project with De Concini.