Abstract

Consider the category of strict polynomial functors $\mathcal{P}_d$ with the ground field k of positive characteristic $p > 0$. The first non-trivial homological properties appear for $d = p$. In my talk, first of all, I will remind basic definitions and results related to the category $\mathcal{P}_p$, e.g. the structure of $\mathcal{P}_d$ as the highest weight category and definitions and results about Koszul and de Rham complexes with the focus on the case $d = p$. Then I will present computational result about the dimensions of the graded vector spaces $\mathrm{Ext}^*(F_\lambda, S_\mu)$, $\mathrm{Ext}^*(F_\lambda, F_\mu)$, $\mathrm{Ext}^*(S_\lambda, S_\mu)$, $\mathrm{Ext}^*(S_\lambda, F_\mu)$ and $\mathrm{Ext}^*(S_\lambda, W_\mu)$, where, for fixed Young diagram λ, $S_\lambda, W_\lambda, F_\lambda$ is Schur, Weyl and simple functor, respectively, and all Ext's are computed in the category $\mathcal{P}_p$. Finally, the structure of the Yoneda product in the Yoneda algebra of simple functors $\mathrm{Ext}^*(F, F)$ with $F = \bigoplus_\lambda F_\lambda$ will be described. One can derive from it the formality of the endomorphism algebra whose the cohomology algebra is the Yoneda algebra of simple functors. A similar results will be presented for the Yoneda algebra of Schur functors $\mathrm{Ext}^*(S, S)$ with $S = \bigoplus_\lambda S_\lambda$.