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Noetherianity and Ext

The importance of the relationship between an algebra and its Ext-algebra is well established. On the other hand, little is known about which properties of the algebra or its representations imply, or are implied by the noetherianity of the Ext-algebra. The main thrust of this talk is the study of such properties. Particular attention is given to the case when the algebra is Koszul. Some of the results presented are given below.

We prove that if every module in $\mathrm{gr}(R)$ has a finitely generated Ext-module, $\bigoplus_{n\geq 0} \mathrm{Ext}_R^n(R/J, R/J)$, where J is the graded Jacobson radical of a standard graded algebra R, then R is left noetherian.

We prove that if R is a Koszul algebra of finite global dimension, then R being left noetherian is equivalent to every module $M = \bigoplus_i M_i$ in $\mathrm{gr}\, R$ has the property that for some n, the module $M_n \oplus M_{n+1} \oplus \cdots$ is linear.