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Title: Extensions in a module category

If  $H$  is a finite dimensional hereditary algebra, the finite dimensional indecomposable  $H$ -modules are divided into three disjoint classes: the preprojective modules, preinjective modules and regular modules. These modules can be characterized as follows: an indecomposable  $H$ -module  $X$  is preprojective if and only if  $\text{Ext}^1(X, -)$  almost vanishes in  $\text{ind}H$ , and  $X$  is preinjective if and only if  $\text{Ext}^1(-, X)$  almost vanishes in  $\text{ind}H$ , and  $X$  is regular if and only if neither  $\text{Ext}^1(X, -)$  nor  $\text{Ext}^1(-, X)$  almost vanish in  $\text{ind}H$ . This observation motivates us the following question: if  $A$  is an artin algebra of infinite representation type, does there exist an indecomposable  $A$ -module  $M$  such that neither  $\text{Ext}^1(X, -)$  nor  $\text{Ext}^1(-, X)$  almost vanish in  $\text{ind}A$ ? The purpose of this talk is to present an affirmative answer to this question in case  $A$  is a finite dimensional algebra over an algebraically closed field. Our technique involves our recent theory of Auslander-Reiten sequences in a Krull-Schmidt category and a generalized version of subadditive function for valued translation quivers introduced by Happel, Preiser, and Ringel.