BIRGE HUISGEN-ZIMMERMANN, University of California at Santa Barbara

Strongly tilting truncated path algebras

We call a path algebra $\Lambda = KQ/I$ of a quiver Q with coefficients in a field K *truncated* if I consists of all paths in Q of a fixed length $L \geq 2$. Note that this class of algebras includes the finite dimensional split hereditary algebras, while, on the other hand, every finite dimensional split algebra occurs as a quotient of a truncated path algebra.

It is shown that for any truncated path algebra Λ, the subcategory $\mathcal{P}^{<\infty}(\Lambda - \mathrm{mod})$ consisting of the objects of finite projective dimension in $\Lambda - \mathrm{mod}$ is contravariantly finite in $\Lambda - \mathrm{mod}$. Hence, due to Auslander and Reiten, there exists a (unique basic) tilting module T which is Ext-injective in $\mathcal{P}^{<\infty}(\Lambda - \mathrm{mod})$. If $\widetilde{\Lambda} = \mathrm{End}_{\Lambda}(T)^{\mathrm{op}}$ is the corresponding "strongly tilted algebra", its category $\mathcal{P}^{<\infty}(\mathrm{mod} - \widetilde{\Lambda})$ is in turn contravariantly finite in $\mathrm{mod} - \widetilde{\Lambda}$. The result is replicated as one moves on to the strongly tilted algebra of $\widetilde{\Lambda}$. We discuss the particularly strong connection between the structure of the representations of Λ and those of its successive strongly tilted algebras.

The first part of the talk addresses joint research with Alex Dugas.