

Igusa-Todorov and Triangular matrix algebras

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Abstract

Let $\Lambda = \begin{pmatrix} T & 0 \\ {}_U M_T & U \end{pmatrix}$ be a triangular matrix R -algebra and M be an U - T -bimodule, where R acts centrally on M . Assume that M is finitely generated over R , and that T and U are artin R -algebras. We prove that if $\text{Ext}_U^1(M, \Omega(\text{mod } U)) = 0$ and $M_T \in \text{proj}(T)$, then Λ is n -Igusa-Todorov if, and only, if T and U are n -Igusa-Todorov. As a Corollary we get that the following statements are equivalent.

- (a) Λ is n -Igusa-Todorov.
- (b) $T_k(\Lambda)$ is n -Igusa-Todorov, for any $k \geq 2$.
- (c) $T_k(\Lambda)$ is n -Igusa-Todorov, for some $k \geq 2$.

where the k -triangular matrix R -algebra $T_k(\Lambda)$ is the matrix of size $k \times k$ with entries $[T_k(\Lambda)]_{i,j} = \Lambda$ for $i \geq j$, and $[T_k(\Lambda)]_{i,j} = 0$ otherwise. Conditions about syzygy finiteness of triangular matrix algebras are also discussed on the talk.

Keywords

Pullback diagram, Igusa-Todorov algebras, finitistic dimension, representation-finite, triangular matrix algebras.