



Mathematics > Representation Theory

# Representation dimensions of triangular matrix algebras

Hongbo Yin, Shunhua Zhang

(Submitted on 19 Jul 2011)

Let  $A$  be a finite dimensional hereditary algebra over an algebraically closed field  $k$ ,  $T_2(A) = \begin{pmatrix} A & 0 \\ 0 & A \end{pmatrix}$  be the triangular matrix algebra and  $A^{(1)} = \begin{pmatrix} A & 0 \\ 0 & DA \end{pmatrix}$  be the duplicated algebra of  $A$  respectively. We prove that  $\dim \text{rep} T_2(A)$  is at most three if  $A$  is Dynkin type and  $\dim \text{rep} T_2(A)$  is at most four if  $A$  is not Dynkin type. Let  $T$  be a tilting  $A$ -module and  $\text{ol} T = T \oplus \text{ol} P$  be a tilting  $A^{(1)}$ -module. We show that  $\text{End}_{A^{(1)}} \text{ol} T$  is representation finite if and only if the full subcategory  $\{(X, Y, f) \mid X \in \text{mod} A, Y \in \tau^{-1} \text{mod} F(T_A) \cup \text{add} A\}$  of  $\text{mod} T_2(A)$  is of finite type, where  $\tau$  is the Auslander-Reiten translation and  $\text{mod} F(T_A)$  is the torsion-free class of  $\text{mod} A$  associated with  $T$ . Moreover, we also prove that  $\dim \text{End}_{A^{(1)}} \text{ol} T$  is at most three if  $A$  is Dynkin type.

Comments: 19 pages

Subjects: **Representation Theory (math.RT)**

Cite as: **arXiv:1107.3865v1 [math.RT]**

## Submission history

From: Shunhua Zhang [[view email](#)]

[v1] Tue, 19 Jul 2011 23:59:03 GMT (13kb)

*Which authors of this paper are endorsers?*

## Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

## Current browse context:

math.RT

< [prev](#) | [next](#) >

[new](#) | [recent](#) | [1107](#)

## Change to browse by:

[math](#)

## References & Citations

- [NASA ADS](#)

## Bookmark (what is this?)

