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On \(\tau\)-tilting finiteness of the Schur algebra. (English) Zbl 07389909
J. Pure Appl. Algebra 226, No. 1, Article ID 106818, 29 p. (2022)

T. Adachi et al. [Compos. Math. 150, No. 3, 415–452 (2014; Zbl 1330.16004)] introduced \(\tau\)-tilting theory.
L. Demonet et al. [Int. Math. Res. Not. 2019, No. 3, 852–892 (2019; Zbl 07130859)] initiated the study of \(\tau\)-tilting finite algebras. So far \(\tau\)-tilting finite algebras have been classified for many classes of finite dimensional algebras such as algebras with radical square zero, preprojective algebras of Dynkin type, Brauer graph algebras, biserial algebras, and minimal wild two-point algebras. In the paper under review, the author tries to classify \(\tau\)-tilting finite Schur algebras over an algebraically closed field of characteristic \(p > 0\). He proves that all tame Schur algebras are \(\tau\)-tilting finite. For the wild Schur algebras \(S(n, r)\) with \(p = 2, n = 2, r = 6, 13, 15\) or \(p = 2, n = 3, r = 5\) or \(p = 2, n = 4, r = 4\) or \(p = 2, n = 5, r = 5\) or \(p \geq 5, n = 2, p^2 \leq r \leq p^2 + p - 1\), he cannot determine whether they are \(\tau\)-tilting finite or not at present since the number of pairwise non-isomorphic basic support \(\tau\)-tilting modules is huge for them, but he conjectures they are. Except for the cases above, he can show that a wild Schur algebra \(S(n, r)\) is \(\tau\)-tilting finite if and only if \(p = 2, n = 2, r = 6, 13, 15\) or \(p = 2, n = 3, r = 5\) or \(p = 2, n = 4, r = 4\).

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MSC:
16G10 Representations of associative Artinian rings
20G05 Representation theory for linear algebraic groups
16G60 Representation type (finite, tame, wild, etc.) of associative algebras

Keywords:
Schur algebras; \(\tau\)-tilting finite; representation-finiteness

Full Text: DOI

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