

Bautista, Raymundo

On algebras of strongly unbounded representation type. (English) Zbl 0584.16017

Comment. Math. Helv. 60, 392-399 (1985).

The second Brauer-Thrall conjecture asserts that every representation- infinite finite dimensional algebra over an algebraically closed field k is of strongly unbounded type, that is, there is an infinite sequence of positive numbers $d_1 < d_2 < \dots < d_s < \dots$ such that for each d_i there are infinitely many isomorphism classes of indecomposable modules with k -dimension d_i . The first (affirmative) proof of this conjecture, using vector space category methods, due to *L. A. Nazarova* and *A. V. Rojter* [*Mitt. Math. Sem. Gießen* 115, 1-153 (1975; [Zbl 0315.16021](#))] contains "delicate points".

A new interesting geometric proof for fields k of characteristic different from 2 is presented here. Together with a recent result of *K. Bongartz* [*Comment. Math. Helv.* 60, 400-410 (1985)] this gives a proof for arbitrary characteristic. The proof presented here depends heavily on the work of *R. Bautista*, *P. Gabriel*, *A. V. Rojter* and *L. Salmerón* on multiplicative bases [*Invent. Math.* 81, 217-285 (1985; [Zbl 0575.16012](#))] and uses covering techniques. Independent proofs of the second Brauer-Thrall conjecture have been also obtained by *U. Fischbacher* [*C. R. Acad. Sci., Paris, Sér. I* 300, 259-262 (1985)] and *O. Betscher* and *G. Todorov* [*Lect. Notes Math.* 1177, 50-54 (1986)].

Reviewer: [A.Skowroński](#)

MSC:

- 16Gxx** Representation theory of associative rings and algebras
- 16P10** Finite rings and finite-dimensional associative algebras
- 16B50** Category-theoretic methods and results in associative algebras (except as in 16D90)
- 16Exx** Homological methods in associative algebras
- 16D70** Structure and classification for modules, bimodules and ideals (except as in 16Gxx), direct sum decomposition and cancellation in associative algebras)

Cited in **2** Reviews
Cited in **21** Documents

Keywords:

ray-category; essential contour; ghost; abelian covering; second Brauer- Thrall conjecture; representation-infinite finite dimensional algebra; strongly unbounded type

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