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Generic complexes and derived representation type for Artin algebras

Let A be an Artin algebra and $D(A)$ its bounded derived category. We recall that $D(A)$ is called discrete and A derived discrete if for any sequence $h = (h_i)_{i\in\mathbb{Z}}$ of non-negative integers with almost all the $h_i = 0$, there are only finitely many isoclasses of indecomposable objects $X \in D(A)$ with length of $H^i(X) = h_i$ for all $i \in \mathbb{Z}$.

We prove the following:

Theorem *The Artin algebra A is not derived discrete if and only if there is a bounded complex of projective A-modules $X = (X^i, d^i_X)$ with the following properties:*

(i) for all i the image of d^i_X is in the radical of X^{i+1};

(ii) X is indecomposable in the homotopy category of complexes;

(iii) there is some j such that $H^j(X)$ has not finite length;

(iv) for all i, $H^i(X)$ has finite length as left E-module, where E is the endomorphism ring of X in the homotopy category of complexes.

A complex as before is called generic complex. In case A is a finite-dimensional algebra over an algebraically close field, we also consider the tame representation type in terms of generic complexes.