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*Auslander-Reiten components with bounded short cycles*

Let  $A$  be an artin algebra. Cycles in the category  $\text{mod } A$  of finitely generated left  $A$ -modules have been extensively studied. In this talk, we shall present a joint work with Jinde Xu on AR-components  $\Gamma$  of  $\text{mod } A$  for which there exists a bound for the depths of the maps on short cycles passing through only modules in  $\Gamma$ . Our main result says that such an AR-component consists of a finite core containing all possible oriented cycles, finitely many left stable components which are predecessor-closed subquivers of tilted quotient algebras of  $A$ , and finitely many right stable components which are successor-closed subquivers of tilted quotient algebras of  $A$ . As a consequence,  $A$  is representation-finite if and only if there exists a bound for the depths of the maps on short cycles in  $\text{mod } A$ . This includes a well known result of Ringel's saying that a representation-directed algebra is representation-finite, which was generalized later by Happel and Liu.