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GENERALIZED STANDARD AUSLANDER-REITEN COMPONENTS WITHOUT ORIENTED CYCLES

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Introduction

Let A be an artin algebra, mod A the category of finitely generated right A-modules, $\mathrm{rad}^\infty(\mathrm{mod}\,A)$ the infinite radical of mod A, and Γ_A the Auslander-Reiten quiver of A. It is known that Γ_A describes the quotient cagegory $\mathrm{mod}\,A/\mathrm{rad}^\infty(\mathrm{mod}\,A)$. We are intersted in the behaviour of connected components of Γ_A in the module category mod A. We introduced in [14] the concept of a generalized standard component and proved some facts on such components. A component $\mathcal{C}$ of Γ_A is called *generalized standard* if $\mathrm{rad}^\infty(X, Y)=0$ for all X and Y from $\mathcal{C}$. Examples of generalized standard components are all preprojective components, preinjective components, and connecting componets of tilted algebras. We proved in [14] that a generalized standard connected component of Γ_A admits at most finitely many nonperiodic $D\mathrm{Tr}$-orbits. Moreover, we described regular and semi-regular generalized standard components of Γ_A containing no oriented cycle, and proved that all but a finite number of generalized standard components of Γ_A are stable tubes.

The main aim of this paper is to describe arbitrary generalized standard components without oriented cycles. As an application we obtain new characterizations of tilted algebras and concealed algebras.

The paper is organized as follows. In Section 1 we recall some notions and facts from the representation theory of artin algebras needed in the paper. Section 2 contains a description of generalized standard components without oriented cycles. In Section 3 we characterize generalized standard components containing sections, and prove some characterizations of tilted algebras. Section 4 contains some new characterizations of concealed algebras.

1. Preliminaries

Let A be an artin algebra over a commutative artin ring R. We denote by

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