STABLE AR COMPONENTS CONTAINING NON-PERIODIC HELLER LATTICES OF $\mathcal{O}[X,Y]/(X^2,Y^2)$ OVER A COMPLETE D.V.R.

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In the Auslander–Reiten theory, we visualize the categories of modules by using Auslander–Reiten quivers, which encapsulate much information on indecomposable modules and irreducible morphisms. One of the classical problems in the representation theory is describing Auslander–Reiten quivers for various algebras. However, in the case of algebras over $\mathcal{O}$, where $\mathcal{O}$ is a complete discrete valuation ring, there are few examples, since it is difficult to compute almost split sequences of such algebras.

We consider the case of the **Kronecker algebra** $A = \mathcal{O}[X,Y]/(X^2,Y^2)$. Since $A \otimes \kappa$ is a special biserial algebra, where κ is the residue field, one can calculate the Heller lattices which is defined as the first syzygy of indecomposable $A \otimes \kappa$ modules over mod A. The aim of this paper is to determine the unique component, say $\mathcal{C}$, of the stable Auslander–Reiten quiver that contains the non-periodic Heller lattices of the string $A \otimes \kappa$-modules. The main idea is to construct a function d', which is defined by the following formula:

$$d' : \mathcal{C} \ni X \longmapsto \sharp\{\text{non-projective indecomposable direct summands of } X \otimes \kappa\} \in \mathbb{Z}_{\geq 0},$$

and the function d' allows us to prove that $\mathcal{C}$ has no loops.

<u>Main result:</u> The main result in the talk is the following.

Main Theorem. Let $A = \mathcal{O}[X,Y]/(X^2,Y^2)$. Then a component, say $\mathcal{C}$, of the stable Auslander–Reiten quiver that contains non-periodic Heller lattices of string $A \otimes \kappa$-modules is $\mathbb{Z}A_\infty$, and the non-periodic Heller lattices appear on the boundary in $\mathcal{C}$.

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