

An Introduction to Auslander-Reiten Theory

Abstract

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I. Some homological algebra. Projective and injective modules. Short survey on Ext^1 .

II. Almost split sequences. Almost split maps. The Auslander-Bridger transpose. The local dual of a module. Every finitely presented non-projective module with local endomorphism ring is end-term of an almost split sequence.

III. Artin algebras. Artin algebras: definition and first properties. The duality. The Auslander-Reiten translation. Existence of almost split sequences over Artin algebras. The Auslander-Reiten formula. The Auslander-Reiten quiver.

IV. Artin algebras of finite representation type. The module category of an Artin algebra of finite representation type is completely described by the AR-quiver.

V. Hereditary Artin algebras. Hereditary rings. Preprojective, preinjective and regular components. Translation quivers. Shape of the regular components of a hereditary Artin algebra. Stable tubes. The Kronecker Algebra.