On the composition of irreducible morphisms and the powers of the radical of their module category

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Abstract

One of the problems of interest in the Representation Theory of Artin algebras is to know when the composition of n irreducible morphisms between indecomposable modules belongs to the $n+1$ power of the radical of their module category. In this talk we present a survey with old and new results about this subject. For the context of a finite dimensional algebra over a perfect field the above mentioned problem was solved, but for artin algebras when $n \geq 5$ is still an open problem. Recently in a joint work with Nicolás LLodra Schat, we find a solution to decide when the composition of four irreducible morphisms between indecomposable modules over artin algebras belongs to the fifth power of the radical.