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τ-tilting Finiteness under Base Field Extension

Friday, July 25, 2025 11:00 AM (30 minutes)

In rare cases, a finite-dimensional associative algebra admits only finitely many indecomposable modules up to isomorphism. In this case, the algebra is usually easy to understand and we call it representation finite. On the other hand, for representation infinite algebras, a general understanding of all modules is beyond hope. Thus, it makes sense to restrict our attention to particular families of modules. In this talk, we focus on τ-tilting modules, which are closely related to the theory of cluster algebras. As it turns out, many representation infinite algebras have only finitely many basic τ-tilting modules up to isomorphism, in which case we call them τ-tilting finite.

Let $L : K$ be a field extension. A theorem of Jensen-Lenzing from 1982 states that if a K-algebra A is representation finite, then the L-algebra $A \otimes_K L$ is also representation finite, provided that $L : K$ is "nice enough". In my talk I will discuss the question of whether τ-tilting finite algebras are similarly preserved under base field extension, illustrating the theory on many examples. This is based on joint work with Erlend D. Børve.

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