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Representation Dimension and Tilting Theory

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ABSTRACT. Let Λ be an artin algebra over a commutative artinian ring R and let T be a tilting Λ-module with endomorphism $\Gamma = \mathrm{End}_\Lambda(T)$. In this talk, we will study the representation dimension of Γ. Our approach uses the methods of classical tilting theory and the main goal is to obtain some upper bound on $\mathrm{rep.dim}(\Gamma)$. Firstly, a very brief overview of the main topics of classical tilting theory will be presented and we will proceed by focusing on algebras which are Gorenstein and of finite Cohen-Macaulay type and the tilting modules which are simultaneously separating and splitting. The attempt lies in the direction to outline the main steps towards the proof of the following result: for an integer $n \geq 1$, if Λ is n-Gorenstein of finite Cohen-Macaulay type and T is a proper separating splitting tilting module, then $\mathrm{rep.dim}(\Gamma) \leq n+2$. The upshot is that if Λ is a n-Gorenstein artin algebra of finite Cohen-Macaulay type admitting a proper separating-splitting tilting module, then $\mathrm{rep.dim}(\Lambda) \leq n+2$.