Tilting modules over Auslander-Gorenstein algebras

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For a finite dimensional algebra \( \Lambda \) and a non-negative integer \( n \), we characterize when the set \( \text{tilt}_n \Lambda \) of additive equivalence classes of tilting modules with projective dimension at most \( n \) has a minimal (or equivalently, minimum) element. This generalize results of Happel-Unger. Moreover, for an \( n \)-Gorenstein algebra \( \Lambda \) with \( n \geq 1 \), we construct a minimal element in \( \text{tilt}_n \Lambda \). As a result, we give equivalent conditions for a \( k \)-Gorenstein algebra to be Iwanaga-Gorenstein. Moreover, for an \( 1 \)-Gorenstein algebra \( \Lambda \) and its factor algebra \( \Gamma = \Lambda/(e) \), we show that there is a bijection between \( \text{tilt}_1 \Lambda \) and the set \( \text{stilt} \Gamma \) of isomorphism classes of basic support \( \tau \)-tilting \( \Gamma \)-modules, where \( e \) is an idempotent such that \( e\Lambda \) is the additive generator of projective-injective \( \Lambda \)-modules. This is a joint work with Osamu Iyama.

REFERENCES