Tilting modules over Auslander-Gorenstein algebras

Xiaojin Zhang

Nanjing University of Information Science and Technology

Email: xjzhang@nuist.edu.cn

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 $\text{sttilt}\Gamma$ 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

1. O.Iyama and X. Zhang, Tilting modules over Auslander-Gorenstein algebras, Pacific J. Math., 298(2) (2019), 399-416.

2010 Mathematics Subject Classification. .