# On the weakly Iwanaga–Gorenstein property of gendo algebras

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We explore the subject on the weakly Iwanaga–Gorenstein (abbr. IG) property of gendo algebras. Here, a gendo algebra means the ENDOmorphism algebra of a Generator [FK], which often has nice homological properties. From the Morita theoretic viewpoint, the endomorphism algebra of a progenerator admits the same module category as the original algebra. Auslander introduced the notion of representation dimensions and Auslander algebras, which are defined using gendo algebras. As is well-known, they give excelent relationships between representation theoretic properties and homological properties.

The notion of weakly IG algebras was introduced by Ringel–Zhang [RZ]. We say that a finite dimensional algebra over a field is *right IG* if the category of Cohen–Macaulay modules is Frobenius; hence the stable category admits a triangulated category structure. Dually, we define *left IG* algebras. A *weakly IG* algebra is defined to be right and left IG. For examle, an algebra with finite left selfinjective dimension is right IG, so an IG algebra, which has finite left and right selfinjective dimension, is wealy IG. Note that we do not know if a right IG algebra is left IG, and vice versa. The aim of this talk is to construct weakly IG algebras. Here is a main result.

**Theorem 1.** *Let $\Lambda$ be a finite dimensional algebra over a field and $M$ a finite dimensional right $\Lambda$-module. If $\Lambda$ is representation-finite, then the gendo algebra $\mathrm{End}_\Lambda(\Lambda \oplus M)$ is wealy IG with finite CM representation type.*

### References

[FK] M. Fang and S. Koenig, Gendo-symmetric algebras, canonical comultiplication, bar cocomplex and dominant dimension. *Trans. Amer. Math. Soc.* **368** (2016), no. 7, 5037–5055.

[RZ] C. M. Ringel and P. Zhang, Gorenstein-projective and semi-Gorenstein-projective modules. arXiv: 1808.01809.