

# TF equivalence, silting theory and canonical decompositions

*Friday 22 December 2023 11:40 (50 minutes)*

This talk is based on joint work with Osamu Iyama. The representation theory of a finite dimensional algebra  $A$  deals with the category  $\text{mod } A$  of finitely generated  $A$ -modules. One of the main topics is torsion pairs in  $\text{mod } A$ . Functorially finite torsion pairs have been well-studied, but they are too few among all torsion pairs. Thus, we are now studying a wider class called semistable torsion pairs introduced by Baumann-Kamnitzer-Tingley associated to elements of the real Grothendieck group  $K_0(\text{proj } A)_{\mathbb{R}}$  of the category of finitely generated projective  $A$ -modules, which is identified with the Euclidean space whose canonical basis is given by the isoclasses of indecomposable projective  $A$ -modules. By using semistable torsion pairs, I (Asai) introduced an equivalence relation called TF equivalence on  $K_0(\text{proj } A)_{\mathbb{R}}$ . A typical example of TF equivalence classes is the silting cone  $C^\circ(U)$  generated by the g-vectors of indecomposable direct summands of each 2-term presilting complex  $U$ . On the other hand, there can be other TF equivalence classes. To study them, we have found that canonical decompositions introduced by

Derkksen-Fei is useful. I would like to explain some important properties of these notions.

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