

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

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

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