Reduced torsion pairs

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Abstract: Let H be a connected wild hereditary algebra of dimension $n > 0$ over an algebraically closed field K, and H-mod the category of finite dimensional left H-modules. Motivated by the reduction procedure from [**?**], a torsion pair $(\mathcal{T}, \mathcal{F})$ is called *reduced* if the torsion class $\mathcal{T}$ contains no nonzero Ext-projective module and the torsion free class $\mathcal{F}$ no indecomposable Ext-injective module.

For representation finite hereditary algebras reduced torsion pairs cannot exist. If H is connected tame hereditary with tubular family $\mathcal{T}$, then the reduced torsion pairs clearly correspond bijectively to partitions $\mathcal{T} = \mathcal{T}_\infty \cup \mathcal{T}_\in$ as disjoint union. For wild hereditary algebras the existence of non trivial reduced torsion pairs was shown in [**?**]. The aim of this talk is to present

Theorem[2] *Let H be a connected hereditary algebra of infinite representation type. Then there exist antichains of reduced torsion pairs of cardinality* $\mathrm{card} K$.

This is clear for tame hereditary algebras, in the wild case it was unknown.

Using results of Bazzoni, Herbera, Kerner, Trlifaj, respectively Buan, Krause, the reduced torsion pairs correspond bijectively to equivalence classes of big tilting modules without indecomposable finite dimensional direct summands and equivalence classes of big cotilting modules with the same property.

References

[1] I. Assem, o. Kerner, *Constructing torsion pairs*, J. Algebra.**185** (1996) 19-41.

[2] O. Kerner, *Reduced torsion pairs*, JPAA, to appear.