DERIVED EQUIVALENCES FOR COMMUTATIVE NOETHERIAN RINGS

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This is joint work with J. Vitória [1].

Let R be a commutative noetherian ring. The bounded derived category $\mathsf{D}^b(\mathsf{mod}(R))$ of the abelian category of finitely presented R-modules $\mathsf{mod}(R)$ is a triangulated category which contains $\mathsf{mod}(R)$. It also contains many other abelian categories: the *hearts of t-structures*, which in turn have their own bounded derived category. The goal of this talk is the following:

Theorem 1. *The hearts of intermediate t-structures of* $\mathsf{D}^b(\mathsf{mod}(R))$ *all have equivalent bounded derived category.*

This fact is useful, since abelian categories with equivalent derived categories share some invariants; but it is also a bit surprising, since the analogue for non-commutative noetherian rings (say, finite dimensional k-algebras) is completely false (as it would imply that every silting complex is tilting, making Silting Theory pointless).

We will trace the steps of the proof, which involves looking at the unbounded derived category $\mathsf{D}(\mathsf{Mod}(R))$, lifting our intermediate t-structures to certain compactly generated intermediate t-structures of $\mathsf{D}(\mathsf{Mod}(R))$, and showing that they can be obtained from the standard one by successive "deformations" (HRS-tilts), each of which does not change the derived category.

References

[1] S. Pavon and J. Vitória, *Hearts for commutative Noetherian rings: torsion pairs and derived equivalences*, Documenta Mathematica, pp. 829–871, 2021

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