

Functorial approach to rank functions

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Talk based on joint work with Mikhail Gorsky, Frederik Marks and Alexandra Zvonareva.

Abstract

Motivated by the work of Cohn and Schofield on Sylvester rank functions on rings, Chuang and Lazarev have recently introduced the notion of a rank function on a triangulated category ([?]). A rank function is a real-valued, additive, translation-invariant function on the objects of a triangulated category for which the triangle inequality on distinguished triangles holds. It turns out that a rank function on a (skeletally small) triangulated category \mathcal{C} can be recast as translation-invariant additive function on its module category $\text{Mod } \mathcal{C}$. This allows us to relate integral-valued rank functions on \mathcal{C} with endofinite cohomological functors on \mathcal{C} and, when \mathcal{C} is the subcategory of compact objects of a compactly generated triangulated category \mathcal{T} , with endofinite objects in \mathcal{T} and certain closed sets of the Ziegler spectrum of \mathcal{T} . Furthermore, specific classes of rank functions are closely related to different versions of quotient functors between triangulated categories.

References

- [1] Joseph Chuang and Andrey Lazarev, “Rank functions on triangulated categories”, *Journal für die reine und angewandte Mathematik (Crelles Journal)*, 2021(781), pp. 127–164.