Induced G-precoverings of Triangulated Categories

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Covering techniques in representation theory have become important after the work of Bongartz-Gabriel [BG], Gabriel [G] and Riedtmann [Ri]. In fact, at first Riedtmann [Ri] introduce coverings of the Auslander-Reiten quiver Γ_Λ of a representation-finite algebra Λ. Bongartz and Gabriel [BG] developed this notion to provide concrete algorithms which enable us to construct the Auslander-Reiten quivers for plenty of algebras.

Let $\Bbbk$ be a field and G be a group. In [G] Gabriel introduced the notion of Galois G-covering of locally bounded $\Bbbk$-categories with a G-action, to present a technique for the computation of the indecomposable modules over a representation-finite algebra.

Locally bounded G-categories have been well investigated in connection with a so-called covering technique in representation theory of algebras, see [G]. The orbit category $\mathcal{C}/G$ and the canonical functor $P : \mathcal{C} \longrightarrow \mathcal{C}/G$ are naturally constructed from these data, and one studies relationships between Mod-$\mathcal{C}$ and Mod-$(\mathcal{C}/G)$.

Asashiba in [As] generalized the covering technique for an arbitrary $\Bbbk$-categories with a G-action to apply covering techniques to usual additive categories such as the homotopy category $\mathbb{K}(\mathrm{Prj}\text{-}\mathcal{C})$ of projectives and he showed that the pushdown functor $P_{\boldsymbol{\cdot}} : \mathbb{K}^{\mathrm{b}}(\mathrm{prj}\text{-}\mathcal{C}) \longrightarrow \mathbb{K}^{\mathrm{b}}(\mathrm{prj}\text{-}(\mathcal{C}/G))$ is a G-precovering.

Using this generalization, we intend to introduce G-precovering of bounded derived categories, singularity categories and Gorenstein defect categories which are induced by the pushdown functor $P_{\boldsymbol{\cdot}}$. Moreover, we present some applications of our results.

This talk is based on a joint work with H. Asashiba and R. Hafezi.

References

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