

The homotopy category of cotorsion flat modules

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Let R be a commutative Noetherian ring. An R -module is said to be *cotorsion flat* if it is simultaneously cotorsion and flat. The homotopy category formed by the cotorsion flat R -modules is denoted $K(\text{Cot}FR)$; it is a triangulated subcategory of $K(R)$, the homotopy category of R -modules. In this talk we will briefly discuss this category from the point of view of the theory of triangulated categories. In particular, we see that it is a compactly generated triangulated category with small coproducts if in addition R admits a dualizing complex.

We will also consider a cotorsion theory formed by the homotopy category of flat complexes by recognizing the latter as a *Hom*-orthogonal of $K(\text{Cot}FR)$, thus recover a result that already exists in literature and has been proved using set-theoretic methods. Finally we see that, under some assumptions, $K(\text{Cot}FR)$ is triangle equivalent to $K(\text{Proj}R)$, the homotopy category of projective R -modules.

This talk is based on a work in progress, joint with Ali Hajizamani.