

Flat Mittag-Leffler modules and approximations

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Abstract: Drinfeld in 2006 defined an infinite dimensional vector bundle over a scheme to be a quasi-coherent sheaf whose sections in each open affine subset are projective modules.

Gillespie (2007) replaced projective by flat and defined a Quillen model structure on the category of unbounded complexes over the category of quasi-coherent sheaves on a scheme.

Drinfeld proposed to use an intermediate class between the classes of flat and projective modules, that is the class \mathcal{D} of flat Mittag-Leffler modules.

We will present recent results proved by Herbera-Trlifaj on the structure of flat Mittag-Leffler modules and then we will focus on the problem of deciding when the double Ext-orthogonal of \mathcal{D} coincides with the class of all flat modules. Deconstructibility and precovering properties of the class \mathcal{D} will also be discussed.