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# Hopf25

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Parallel sessions, Forum E

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14h30-14h55

## **Comodule theories in Grothendieck categories and relative Hopf objects**

Our objective is to study cohomology theories by means of spectral sequences for relative Hopf modules with coefficients in a Grothendieck category. We begin by developing the categorical algebra of the noncommutative base change of a comodule category by means of a Grothendieck category  $\mathfrak{G}$ . We describe when the resulting category of comodules is locally finitely generated, locally noetherian or may be recovered as a coreflective subcategory of the noncommutative base change of a module category. We then introduce the category  ${}_A\mathfrak{G}^H$  of relative  $(A, H)$ -Hopf modules in  $\mathfrak{G}$ , where  $H$  is a Hopf algebra and  $A$  is a right  $H$ -comodule algebra. We study the cohomological theory in  ${}_A\mathfrak{G}^H$  by means of spectral sequences. Using coinduction functors and functors of coinvariants, we study torsion theories and how they relate to injective resolutions in  ${}_A\mathfrak{G}^H$ . Finally, we use the theory of associated primes and support in noncommutative base change of module categories to give direct sum decompositions of minimal injective resolutions in the category  ${}_A\mathfrak{G}^H$  of relative  $(A, H)$ -Hopf modules in  $\mathfrak{G}$  (this is joint work with M. Balodi and S. Kour).