Conférence
« ARTA III : Avancées en théorie des représentations des algèbres »
16-20 juin 2014

Meeting
"ARTA III. Advances in Representation Theory of Algebras"
June 16–20, 2014

Split-by-nilpotent extensions algebras and stratifying systems

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Let Γ and Λ be artin algebras such that Γ is a split-by-nilpotent extension of Λ by a two sided ideal I of Γ. Consider the change of rings functors $G := {}_{\Gamma}\Gamma_{\Lambda} \bigotimes_{\Lambda} - : \mathrm{mod}(\Lambda) \to \mathrm{mod}(\Gamma)$ and $F := {}_{\Lambda}\Gamma_{\Gamma} \bigotimes_{\Gamma} - : \mathrm{mod}(\Gamma) \to \mathrm{mod}(\Lambda)$. By assuming that I_{Λ} is projective, we find the necessary and sufficient conditions under which a stratifying system $(\Theta, \leq)$ in $\mathrm{mod}\ (\Lambda)$ can be lifted to a stratifying system $(G\Theta, \leq)$ in $\mathrm{mod}(\Gamma)$. Furthermore, by using the functors F and G; we study the relationship between their filtered categories of modules; and some connections with their corresponding standardly stratified algebras are stated.

Joint work with M. Lanzilotta and C. Sáenz.

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