

UNIVERSAL CENTRAL EXTENSIONS RELATIVE TO A BIRKHOOF SUBCATEGORY: THE CASE OF LEIBNIZ ALGEBRAS

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In [3] a relative theory of central extensions was given. In the framework of semi-abelian categories, an study of universal central extensions relative to a Birkhoff subcategory was done in [2] and, in the particular case of Leibniz and Lie n -algebras, this general theory provides some new results on relative universal central extensions of Leibniz n -algebras (see [1]).

In the categorical setting, a relative homology is indicated and a construction of the universal central extension by means of free presentations was done.

Our purpose in the present talk is to particularize the categorical notions on the relative central extensions to the case of Leibniz algebras. In this way, we obtain an explicit construction of a relative chain complex which provides the relative homology of Leibniz algebras and we construct the relative universal central extension of a relative perfect Leibniz algebra by means of the relative homology complex. Here the relativization corresponds to the Liezation functor which assigns to a Leibniz algebra \mathfrak{g} the Lie algebra $\mathfrak{g}/\mathfrak{g}^{\text{ann}}$, $\mathfrak{g}^{\text{ann}} = \langle \{[x, x] : x \in \mathfrak{g}\} \rangle$.

References

- [1] J. M. Casas, E. Khmaladze, M. Ladra and T. Van der Linden, *Som results on homology of Leibniz and Lie n -algebras*, Pré-Publicações do Departamento de Matemática da Universidade de Coimbra **09-46** (2009).
- [2] J. M. Casas and T. Van der Linden, *A relative theory of universal central extensions*, Pré-Publicações do Departamento de Matemática da Universidade de Coimbra **09-10** (2009).
- [3] G. Janelidze and G. M. Kelly, *Galois theory and a general notion of central extension*, J. Pure Appl. algebra **97** (1994), 135–161.

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