## (CO)TRIPLES AND HOCHSCHILD (CO)HOMOLOGY OF SUPERALGEBRAS

## PAUL A. BLAGA

**Abstract.** We show that the Hochschild homology and cohomology of a given (not necessarily commutative)  $\mathbb{Z}_2$ -graded algebra (superalgebra) R over a graded-commutative  $\mathbb{Z}_2$ -graded ring, with coefficients in an R-bimodule can be defined as the homology (cohomology) of a suitable chosen cotriple (triple), with coefficients in a functor.

MSC 2000. 17A70, 16E40, 18C15

Key words. Superalgebras, Hochschild homology, triples.

Acknowledgment. This paper was partially supported by the European Commission, through the Research Training Network "Geometric Analysis".

## REFERENCES

- BARR, M. and BECK, J., Homology and Standard Constructions, in Seminar on Triples and Categorical Homology Theory, LNM80, Springer, 1969.
- [2] BARTOCCI, C., BRUZZO, U. and HERNANDEZ-RUIPEREZ, D., The Geometry of Supermanifolds, Kluwer, 1992.
- [3] BLAGA, P.A., Relative derived functors and Hochschild (co)homology for superalgebras, in Proceedings of "Bolyai 200" International Conference on Geometry and Topology, Cluj-Napoca, 1–5 October 2003, edited by D. Andrica, P. Blaga, Z. Kása and F. Szenkovits, Cluj University Press, Cluj-Napoca (2003), 47–60.
- [4] CARTAN, H. and EILENBERG, S., Homological Algebra, Princeton University Press, 1956.
- [5] CONNES, A., Noncommutative differential geometry, Publications IHES 1985.
- [6] HOCHSCHILD, G., On the cohomology groups of an associative algebra, Ann. of Math., 46 (1945), pp. 58–67.
- [7] HOCHSCHILD, G., Relative homological algebra, Trans. AMS, 82 (1956), pp. 246–269.
- [8] KASSEL, C., A Künneth formula for the cyclic homology of Z/2-graded algebras, Math. Ann., 257 (1986), 683–699.
- [9] KASTLER, D., Cyclic Cohomology within the Differential Envelope, Hermann, Paris, 1988.
- [10] MacLane, S., Homology, Springer Verlag, 1963.
- [11] MACLANE, S., Categories for the Working Mathematician, Springer Verlag, 1971.
- [12] MANIN, YU., Complex Geometry and Gauge Theory, Springer Verlag, 1988.
- [13] WEIBEL, CH., An Introduction to Homological Algebra, Cambridge University Press, 1994.

Received November 15, 2004

"Babeş-Bolyai" University Faculty of Mathematics and Computer Science 1, Kogălniceanu Street, 400084 Cluj-Napoca, Romania E-mail: pablaga@cs.ubbcluj.ro