

On Derived Categories and Derived Functors

SAMSON SANEBLIDZE

*A. Razmadze Mathematical Institute, Department of Geometry and Topology
M. Aleksidze st., 1, 0193 Tbilisi, Georgia, sane@rmi.acnet.ge*

Presented by Teimuraz Pirashvili

Received October 25, 2007

Abstract: For an abelian category, a category equivalent to its derived category is constructed by means of specific projective (injective) multicomplexes, the so-called homological resolutions.

Key words: derived category, derived functor, multicomplex, homological resolution.

AMS Subject Class. (2000): 18G30, 18G10, 18G55.

REFERENCES

- [1] ALONSO, T.L., JEREMIAS, A.L., SOUTO, M.J., Localization in categories of complexes and unbounded resolutions, *Canad. J. Math.* **52** (2000), 225–247.
- [2] BERIKASHVILI, N., On the differentials of spectral sequences (Russian), *Proc. Tbilisi Mat. Inst.* **51** (1976), 1–105.
- [3] BERIKASHVILI, N., Zur homologietheorie der Faserungen I, *Proc. A. Razmadze Math. Inst.* **116** (1998), 1–29.
- [4] DOLD, A., Zur Homotopietheorie der Kettenkomplexe, *Math. Ann.* **140** (1960), 278–298.
- [5] GELFAND, S.I., MANIN, YU.I., “Methods of Homological Algebra”, Springer-Verlag, Berlin, 1996.
- [6] HALPERIN, S., STASHEFF, J.D., Obstructions to homotopy equivalences, *Adv. Math.* **32** (1979), 233–279.
- [7] HELLER, A., Homological resolutions of complexes with operators, *Ann. of Math.* **60** (1954), 283–303.
- [8] HOVEY, M., “Model Categories”, Mathematical Surveys and Monographs 63, American Mathematical Society, Providence, RI, 1999.
- [9] HUEBSCHMANN, J., Minimal free multi-models for chain algebras, *Georgian Math. J.* **11** (2004), 733–752.
- [10] IVERSEN, B., “Cohomology of Sheaves”, Universitext, Springer-Verlag, Berlin, 1986.
- [11] MEYER, J.P., Acyclic models for multicomplexes, *Duke Math. J.* **45** (1978), 76–85.

- [12] SANEBLIDZE, S., Perturbation and obstruction theories in fibre spaces, *Proc. A. Razmadze Math. Inst.* **111** (1994), 1–106.
- [13] SANEBLIDZE, S., Filtered Hirsch algebras, *preprint*, AT/0707.2165.
- [14] SPALTENSTEIN, N., Resolutions of unbounded complexes, *Compositio Math.* **65** (1988), 121–154.
- [15] VERDIER, J.-L., Catégories dérivées, in “Cohomologie Etale, SGA 4 $\frac{1}{2}$ ”, Lecture Notes in Math. 569, Springer-Verlag, Berlin-New York, 1977, 263–311.
- [16] VERDIER, J.-L., Des catégories dérivées des catégories abéliennes, *Astérisque* **239** (1997).