

We study the possibility of derivation of an exact couple in a Raïkov-semiabelian category [1] following the scheme of [2]. Apart from all abelian categories, the class of Raïkov-semiabelian categories contains many non-abelian additive categories of functional analysis and topological algebra. The categories of (Hausdorff or all) topological abelian groups, topological vector spaces, Banach (or normed) spaces, filtered modules over filtered rings, and torsion-free abelian groups are typical examples of Raïkov-semiabelian categories. The main difference between the Raïkov-semiabelian and abelian categories lies in the fact that the standard diagram lemmas hold in Raïkov-semiabelian categories under some extra conditions which usually amount to the strictness of these morphisms. We study the exactness of the derived semiexact couple of an exact couple in a Raïkov-semiabelian category depending on which morphism in the couple is strict.

[1] D. A. Raïkov, Semiabelian categories, Soviet Math. Dokl. 10 (1969), 1242-1245.

[2] B. Eckmann and P. J. Hilton, Exact couples in an abelian category, J. Algebra 3 (1966), 38–87.