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S. K. Hazra
Dept. of Mathematics, School of Natural Sciences, Shiv Nadar University, Uttar Pradesh 201314, India
sk896@snu.edu.in

A. Habib
Dept. of Mathematics, School of Natural Sciences, Shiv Nadar University, Uttar Pradesh 201314, India
amber.habib@snu.edu.in

Wells Exact Sequence and Automorphisms of Extensions of Lie Superalgebras

Let $0 \to \mathfrak{a} \to \mathfrak{e} \to \mathfrak{g} \to 0$ be an abelian extension of Lie superalgebras. In this article, corresponding to this extension we construct two exact sequences connecting the various automorphism groups and the 0-th homogeneous part of the second cohomology group, $H^2(\mathfrak{g}, \mathfrak{a})_0$. These exact sequences constitute an analogue of the well-known Wells exact sequence for group extensions. It follows that the obstruction for a pair of automorphism $(\phi, \psi) \in Aut(\mathfrak{a}) \times Aut(\mathfrak{g})$ to be induced from an automorphism in $Aut_{\mathfrak{a}}(\mathfrak{e})$ lies in $H^2(\mathfrak{g}, \mathfrak{a})_0$. Then we consider the family of Heisenberg Lie superalgebras and show that not all pairs are inducible in this family. We also give some necessary and sufficient conditions for inducibility of pairs arising in this family.

Keywords: Lie superalgebras, extensions, cohomology, Heisenberg Lie superalgebras.

MSC: 17B40, 17B56.