Poisson Brackets and Structure of Nongraded Hamiltonian Lie Algebras Related to Locally-Finite Derivations

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Abstract. Xu introduced a class of nongraded Hamiltonian Lie algebras. These Lie algebras have a Poisson bracket structure. In this paper, the isomorphism classes of these Lie algebras are determined by employing a "sandwich" method and by studying some features of these Lie algebras. It is obtained that two Hamiltonian Lie algebras are isomorphic if and only if their corresponding Poisson algebras are isomorphic. Furthermore, the derivation algebras and the second cohomology groups are determined.