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Automorphisms of Non-Singular Nilpotent Lie Algebras

For a real, non-singular, 2-step nilpotent Lie algebra \mathfrak{n} , the group $\text{Aut}(\mathfrak{n})/\text{Aut}_0(\mathfrak{n})$, where $\text{Aut}_0(\mathfrak{n})$ is the group of automorphisms which act trivially on the center, is the direct product of a compact group with the 1-dimensional group of dilations. Maximality of some automorphisms groups of \mathfrak{n} follows and is related to how close is \mathfrak{n} to being of Heisenberg type. For example, at least when the dimension of the center is two, $\dim \text{Aut}(\mathfrak{n})$ is maximal if and only if \mathfrak{n} is of Heisenberg type. The connection with fat distributions is discussed.

Keywords: Lie groups, Lie algebras, Heisenberg type groups.

MSC: 17B30, 16W25