N. E. Rojas

FCEFyN, Universidad Nacional, Ciudad Universitaria, (5000) Córdoba, Argentina
`nrojas@efn.uncor.edu`

Minimal Faithful Representation of the Heisenberg Lie Algebra with Abelian Factor

For a finite dimensional Lie algebra $\mathfrak{g}$ over a field $\mathfrak{k}$ of characteristic zero, the μ-function (respectively μ_{nil}-function) is defined to be the minimal dimension of V such that $\mathfrak{g}$ admits a faithful representation (respectively a faithful nilrepresentation) on V. Let $\mathfrak{h}_m$ be the Heisenberg Lie algebra of dimension $2m+1$ and let $\mathfrak{a}_n$ be the abelian Lie algebra of dimension n. The aim of this paper is to compute $\mu(\mathfrak{h}_m \oplus \mathfrak{a}_n)$ and $\mu_{\mathrm{nil}}(\mathfrak{h}_m \oplus \mathfrak{a}_n)$ for all $m, n \in \mathbb{N}$. We also give a faithful representation and faithful nilrepresentation of $\mathfrak{h}_m \oplus \mathfrak{a}_n$ of minimal dimension for all $m, n \in \mathbb{N}$.

Keywords: Nilpotent Lie algebras, Heisenberg Lie algebra, Ado's Theorem, minimal faithful representation, nilrepresentation.

MSC: 17B10, 17B30, 20C40