

ON REALIZATIONS OF LIE ALGEBRAS

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In this talk we survey and compare several methods of representation of Lie algebras by vector fields, namely we consider the direct method [2], the Shirokov's method [3], the Blattner's method [1] and standard weight representations [4]. We consider Lie algebras defined by their structure constants tensor in some fixed basis and study the problem of construction of all their realizations.

Definition 1. A *realization* of a Lie algebra $\mathfrak{g}$ in vector fields on a domain $M \subset \mathbb{C}^m$ (or $M \subset \mathbb{R}^m$) is a homomorphism $R: \mathfrak{g} \rightarrow \text{Vect}(M)$.

The interest to this subject is motivated by a number of applications, in particular in classification and integration of differential equations, see [2] for more applications.

We present several illustrative examples, contrary instances and some new results concerning realizations of special linear Lie algebra.

REFERENCES

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