Standard bases of ideals of free Lie algebras over rings

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Abstract. In the talk we present our results on standard bases of ideals of free Lie algebras over rings: criteria for subsets of ideals of free Lie algeras to be standard bases of these ideals; algorithms to construct standard bases; algorithms to solve word problems, ideal membership problems, etc.

Standard bases of ideals of free Lie algebras were introduced by A. I. Shirshov in [5]. This theory was used in solutions of many important algorithmic problems of algebra ([5], [6], [7], [1]). In our proofs we use these results, combinatorics on Lyndon-Shirshov words and monomials ([2], [8], [1], [3], [4]), in particular, algorithms for rearrangement of brackets.

Applications of our results are algorithms for symbolic computation in Lie algebras over rings.

References

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