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Benson-Ratcliff Conjecture on Solvable Lie algebras.

Abstract

In this paper, we study the conjecture of Benson and Ratcliff, which deals with the class of nilpotent Lie algebras of a one-dimensional center. We show that this conjecture is true for any nilpotent Lie algebra $\mathfrak{g}$ with $dim\mathfrak{g} \leq 5$, but it fails for the dimensions greater or equal to 6. To this end, we produce counter-examples to the Benson-Ratcliff conjecture in all dimensions $n \geq 6$. Finally, we show that this conjecture is true for the class of three-step nilpotent Lie algebras and for some other classes of nilpotent Lie algebras.