# Abstract

Semisimple Lie algebras have been completely classified by Cartan and Killing. The Levi theorem states that every finite dimensional Lie algebra is isomorphic to a semidirect sum of its largest solvable ideal and a semisimple Lie algebra. These focus the classification of solvable Lie algebras as one of the main challenges of Lie algebra research. One approach towards this task is to take a class of nilpotent Lie algebras and construct all extensions of these algebras to solvable ones. In this paper, we propose another approach, i.e., to decompose a solvable nonnilpotent Lie algebra to two nilpotent Lie algebras which are called the left and right nilpotent algebras of the solvable algebra. The right nilpotent algebra is the smallest ideal of the lower central series of the solvable algebra, while the left nilpotent algebra is the factor algebra of the solvable algebra and its right nilpotent algebra. We show that the solvable algebras are decomposable if its left nilpotent algebra is an Abelian algebra of dimension higher than one and its right algebra is an Abelian algebra of dimension one. We further show that all the solvable algebras are isomorphic if their left nilpotent algebras are Heisenberg algebras of fixed dimension and their right algebras are Abelian algebras of dimension one.