Classification of Seven-Dimensional Lie Algebras with $H \oplus \mathbb{R}^3$ Nilradical. Preliminary report.

Low dimensional solvable Lie algebra classification started back in 1963 by Mubarakzyanov. Solvable Lie algebras were completely classified up to dimension six. A general theorem asserts that if $\mathfrak{g}$ is a solvable Lie algebra of dimension $n$, then the dimension of the nilradical is at least $\frac{n^2}{2}$. For the seven- dimensional algebras, the nilradical’s dimension could be 4, 5, 6 or 7. The four and seven dimensional nilradical cases were classified. We examine the six-dimensional nilradical case, and depending on the structure of this nilradical there are 32 classes. In this project we focus on the class where the nilradical is to a direct sum of a three-dimensional Heisenberg and a three-dimensional abelian algebras ($H \oplus \mathbb{R}^3$). (Received September 20, 2015)