Classification of non-conjugate subalgebras of dimensions up to five of the Lie algebra of the Poincaré group $P(1,4)$

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Non-conjugate subalgebras of the Lie algebras of Lie groups of point transformations play an important role in solving different tasks of the theoretical and mathematical physics, mechanics, gas dynamics, etc. (see, for example, [1, 2, 3]). However, the possibilities of the above mentioned applications, as well as the results obtained essentially depend on the structural properties of non-conjugate subalgebras of Lie algebras. One way to study the structural properties of non-conjugate subalgebras of the Lie algebras consists in classifying these subalgebras into isomorphism classes.

The present report is devoted to the classification of non-conjugate subalgebras of the Lie algebra of the Poincaré group $P(1,4)$ into isomorphism classes. The group $P(1,4)$ is a group of rotations and translations of five-dimensional Minkowski space $M(1,4)$. Some applications of this group in the theoretical and mathematical physics can be found in [4, 5, 6]. Continuous subgroups of the group $P(1,4)$ have been described in [7, 8, 9, 10, 11]. Until now, using the Mubarakzjanov's classification [12, 13] of the real Lie algebras of dimensions up to five, we have performed the classification of all non-conjugate subalgebras of dimensions up to five of the Lie algebra of the group $P(1,4)$ into isomorphism classes. The results of classification of all non-conjugate subalgebras of dimensions up to four of the Lie algebra of the group $P(1,4)$ can be found in [14, 15].

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