On non-equivalent functional bases of invariants of the non-conjugate subgroups of the extended Galilei group $\widetilde{G}(1,3) \subset P(1,4)$.

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It is well known that functional bases of invariants of non-conjugate subgroups of the Lie groups of point transformations play an important role in solving the task of symmetry reduction for PDEs invariant with respect to these groups (see, for example, [1, 2, 3]).

The group $P(1,4)$ is a group of rotations and translations of the 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]. One of the nontrivial consequences of the description of non-conjugate subalgebras of the Lie algebra of the group $P(1,4)$ is that the Lie algebra of group $P(1,4)$ contains as subalgebras Lie algebra of the Poincaré group $P(1,3)$ and Lie algebra of the extended Galilei group $\widetilde{G}(1,3)$ [12], i.e. it naturally unites the Lie algebras of the symmetry groups of relativistic and non-relativistic physics.

The present report is devoted to the construction of non-equivalent functional bases of invariants for non-conjugate subgroups of the group $\widetilde{G}(1,3) \subset P(1,4)$. Until now, using the criterion of equivalency [13], we have constructed the non-equivalent functional bases of invariants for all non-conjugate subgroups of the group $\widetilde{G}(1,3)$ in the space $M(1,3) \times R(u)$. Here, $M(1,3)$ is the four–dimensional Minkowski space; $R(u)$ is the number axis of the variable u.

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