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ELEMENTARY PROPERTIES OF CHEVALLEY GROUPS OVER FIELDS AND RINGS

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The first result on relation between elementary equivalence of some models with elementary equivalence of derivative models was proved by A. I. Maltsev in 1961 in his paper [1]. He proved that the groups $G_n(K)$ and $G_m(L)$ ($G = \mathrm{GL}$, SL, PGL, PSL, $n \geq 4$, $m \geq 3$, and K and L are fields of characteristic 0) are elementarily equivalent if and only if $m = n$ and the fields K and L are elementarily equivalent.

This theory was continued in 1992 when with the help of the construction of ultraproduct and the isomorphism theorem Kostya Beidar and Alexandr V. Mikhalev in the paper [2] formulated a general approach to problems of elementary equivalence of different algebraic structures, and generalize Maltsev theorem for the case when K and L are skewfields and associative rings.

In 1998–2001 Elena Bunina continued to study some problems of this type (see [3]–[5]). She generalized the results of Maltsev for unitary linear groups over skewfields and associative rings with involutions, and also for Chevalley groups over algebraically closed fields.

Now I present some new results generalizing the results on elementary equivalence of Chevalley groups over algebraically closed fields on the cases of arbitrary infinite fields of characteristic not equal to 2, and of local (semilocal and some other) commutative rings.

References.

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[4] E. I. Bunina. *Elementary equivalence of Chevalley groups.* Russian Mathematical Surveys, 2001, 56(1), 152.

[5] E. I. Bunina and A. V. Mikhalev. *Elementary propertiese of linear groups and related questions.* Journal of Mathematical Sciences, 2004, 123(2), 3921-3985.