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ON THE HASSE PRINCIPLE, R-EQUIVALENCE AND WEAK APPROXIMATION IN LINEAR ALGEBRAIC GROUPS OVER PSEUDOGLOBAL FIELDS

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Let k be a pseudoglobal fields of characteristic zero, i.e. an algebraic function field in one variable with pseudofinite [1] constant field of characteristic zero. It is known [2] that the field k has the following properties:

1) its cohomological dimension is 2;
2) index and exponent of central simple algebras over k coincide;
3) the maximal abelian extension of k has cohomological dimension 1;
4) $H^1(k,G)=1$ for any semisimple simply connected linear algebraic group over k.

The results of J.-L. Colliot-Thélène, P. Gille and R. Parimala [3] imply that for linear algebraic groups over fields with properties 1)–4) many arithmetical features of linear algebraic groups over global fields remain true in this more general situation. Some of such features for linear algebraic groups over pseudoglobal fields are quoted in the following theorem.

Theorem 1. *The group of R-equivalence classes and the defect of weak approximation are trivial for simply connected, adjoint, absolutely almost simple groups, and for inner forms of groups splitting by a metacyclic extension. They are finite for arbitrary connected linear algebraic group. Moreover, for a connected linear algebraic group the obstruction to the Hasse principle is a finite abelian group, and it is trivial for simply connected groups.*

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