ERRATA FOR "LEVI DECOMPOSITIONS FOR A LINEAR ALGEBRAIC GROUP"

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Errata for (McNinch 2010):

(1) The result (3.3.2) is incorrect. Indeed, the indicated subgroup M' of the parabolic subgroup P has no reason to be reductive, and in particular there is no reason to expect the quotient morphism $P \to P/R_u P$ to restrict to an isogeny $M' \to P/R_u P$, purely inseparable or otherwise.

In fact, consider an algebraically closed field k of characteristic $p \geq 0$. Then arguing as in (Babinski and Stewart 2018, Corollary 2.4) – which depends on the result (Vasiu 2005, Theorem 1.2) of Vasiu – one obtains the following: Let G be a linear algebraic group over k. If $C \subset G$ is a reductive subgroup, if $p \neq 2$ and if $G = C \cdot R_u G$, then the quotient map restricts to an isomorphism $\pi : C \xrightarrow{\sim} G/R_u G$ of algebraic groups.

This shows immediately for $p > 2$ that the conclusion of (3.3.2) is incorrect.

If $p = 2$, one knows quite a bit about the possible exceptions to the previous statement; see *loc. cit.* Using this additional information, one sees that the statement (3.3.2) remains incorrect when $p = 2$.

REFERENCES

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