CORRIGENDUM FOR *MORPHISMS OF CHARACTER VARIETIES*

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In the paragraph following Lemma 4.2, the following definition is made: "If G is a geometrically reductive smooth affine group scheme over a henselian DVR A with fraction field K and valuation v, then we let $G(K)^1$ be the open subgroup $G^0(K)^1 \cdot G(A)$ of $G(K)$". It is then claimed that every bounded subgroup of $G(K)$ is contained in $G(K)^1$. However, this is not true: for instance, if G is the normalizer of the diagonal torus in SL_2, then each element of $G(K) - G^0(K)$ is of finite order (hence generates a bounded subgroup), but $G(K)$ is generated by such elements. So in this case there is no single subgroup $G(K)^1$ containing every bounded subgroup of $G(K)$ such that $G(K)^1 \cap G^0(K) = G^0(K)^1$.

The above claim is used in two ways in the proof of Lemma 4.3 (and nowhere else):

(1) In the first paragraph, it is used to define a bounded open subgroup $U' \subset G(K')$ stabilizing x', containing B, and satisfying $U' \cap G^0(K') = G^0(K')^1_{x'}$. It can be removed by instead defining $U' = G^0(K')^1_{x'} \cdot B$. Since B stabilizes x' and $G^0(K)^1$, this U' has the desired properties.

(2) In the second paragraph, it is used implicitly to obtain that if $A \subset A'$ is a finite local extension of DVRs with fraction field K' and G' is a geometrically reductive smooth affine A'-group scheme with generic fiber $G_{K'}$ such that $G(A')$ and $G'(A')$ stabilize a common hyperspecial point of $\mathscr{B}(G^0_{K'})$, then $G(A') = G'(A')$. However, the above example shows that this is not true.

Both issues are now fixed by [Cot23, Lemma 3.13].

References

[Cot23] S. Cotner. Hom schemes for algebraic groups, 2023, 2309.16458.