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Erratum

Homomorphisms of Barsotti–Tate groups and crystals in positive characteristic

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The assertion (iii) of Lemma 2.1 is false. A counter example was found by T. Zink and W. Messing. We quickly indicate the construction. Let G_0 be a p-divisible group over a perfect field k, together with a closed immersion $i : \alpha_p \to G_0$ over k. Set $G_1 = G_0/i(\alpha_p)$. Further, let $j : \alpha_{p,k[[t]]} \to (G_0 \times G_0)_{k[[t]]}$ be the embedding equal to i in the first coordinate and equal to $t \cdot i$ in the second. Set $G := \mathrm{Coker}(j)$, and $H = G_{1,k[[t]]}$. The counter example is the homomorphism $\gamma : G \to H$ induced by the mapping $pr_2 : G_0 \times G_0 \to G_0$. Indeed, $\mathrm{Ker}(\gamma_{k((t))}) \cong (G_0)_{k((t))}$ is a p-divisible group, but $\mathrm{Ker}(\gamma_0) \cong G_1 \times \alpha_p$ is not.

Lemma 2.1 part (iii) is used only in Definition 2.2. To correct this, one should replace the text “Note....over S.” in the definition of semi-stable reduction by the *condition* that $G^\mu = \mathrm{Ker}(G_1 \to G_2)$ and $G^{\mathrm{et}} = \mathrm{Coker}(G_1 \to G_2)$ are p-divisible groups over S. No other changes are necessary.

The mistake in the proof is in the module theoretic assertion “e generates L implies $(*)$ is exact” on page 332. The reader can easily find a counter example. Messing and Zink point out that the proof does produce a kernel and cokernel for α in the category of p-divisible groups over R.