

CORRECTIONS TO “ p -DESCENT IN CHARACTERISTIC p

DOUGLAS ULMER

- Felipe Voloch points out that the description of $\text{Sel}(K, V)$ in part (a) of Proposition 3.3 is not correct when A is a $(p - 1)^{\text{st}}$ power. Under the hypotheses of the Proposition, Lemma 1.2 shows that $\text{Sel}(K, V) \cong H^1(X, \text{Ker } V)$. There is an exact sequence

$$0 \rightarrow \text{Ker } V \rightarrow \mathcal{O}_X \xrightarrow{\wp_A} \mathcal{O}_X \rightarrow 0$$

where $\wp_A(x) = x^p - Ax$. Taking cohomology yields an exact sequence

$$0 \rightarrow k/\wp_A(k) \rightarrow \text{Sel}(K, V) \rightarrow \{\eta \in H^1(X, \mathcal{O}_X) | Fr(\eta) = A\eta\} \rightarrow 0.$$

When A is not the $(p - 1)^{\text{st}}$ power of an element of k , then $k/\wp_A(x)$ is zero and the statement is correct. However, when A is a $(p - 1)^{\text{st}}$ power, $k/\wp_A(k)$ has order p and the Selmer group is larger than stated.

Our thanks to Voloch for pointing out this mistake.

- Also, on page 241, 4 lines from the bottom, “[6], III.7.5” should be “[7], III.7.5”.