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CORRECTION TO "SHEAVES WITH CONNECTION ON ABELIAN VARIETIES"

MITCHELL ROTHSTEIN

1. Alexander Polishchuk has kindly pointed out that Lemma 2.3 of [R] is a bit too optimistic. Therefore, another proof of the main theorem [R, Theorem 2.2] must be given.

The problem with Lemma 2.3 is the following. Consider a map of complexes $X^{\cdot} \xrightarrow{u} Y^{\cdot}$. Then one has the exact triangle

$$X^{\cdot} \xrightarrow{u} Y^{\cdot} \xrightarrow{v} C_u \xrightarrow{w} T(X^{\cdot}), \tag{1.1}$$

where C_u is the cone of u. Having defined isomorphisms $\phi_X: X \to \zeta(X)$ and $\phi_Y: Y \to \zeta(Y)$, I wanted to assert that there is a canonical morphism $C_u \to \zeta(C_u)$. The difficulty with choosing such a morphism canonically is that one does not have an equality of the form $\zeta(C_u) = C_{\zeta(u)}$. Indeed, since $\zeta(u)$ is a morphism not in the category of complexes but only in the derived category, the object $C_{\zeta(u)}$ is not even defined, except up to a noncanonical isomorphism.

One possibility would be to try to salvage Lemma 2.3 using recent results of D. Orlov [O], which establish the lemma under some additional hypotheses. Another approach (which I had originally intended to take before finding the false shortcut) is to adapt Mukai's original proof [M, Theorem 2.2]. The latter method has some ideas which may be of interest and, in any case, gives a stronger theorem, insofar as it eliminates the restriction to only the bounded derived category.

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2. Let X and Y be abelian varieties over an algebraically closed field k, dual to one another, and let $\mathscr{P}$ denote the Poincaré sheaf. The functors

$$\mathrm{Mod}(X)_{sp} \xrightarrow{S_1} \mathrm{Mod}(Y)_{cxn} \xrightarrow{S_2} \mathrm{Mod}(X)_{sp} \tag{2.1}$$

defined in [R] admit the following alternative description.

2.1. Splittings and twisted connections. Given a scheme Z, a sheaf $\mathscr{M}$ of $\mathscr{O}_Z$-

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