CORRECTIONS TO "LOG ABUNDANCE THEOREM FOR THREEFOLDS"

SEAN KEEL, KENJI MATSUKI, and JAMES MCKERNAN

In Section 6 of *Log abundance theorem for threefolds* by Sean Keel, Kenji Matsuki, and James McKernan [1] , there are several mistakes. Though they are minor in essence, to correct them requires more than a few changes in statements. We decided to rewrite the entire section, which is now only 6 pages long, rather than presenting a list of errata. We are extremely grateful to Qihong Xie for pointing out these mistakes.

6. Bogomolov stability and Mori's bending and breaking technique

We fix some notation for this section.

Let X be a normal projective variety of dimension n over an algebraically closed field of characteristic zero. Let $D_1, D_2, \dots, D_n$ be a sequence of nef Cartier divisors, let $H_1, H_2, \dots, H_n$ be a sequence of $\mathbb{Q}$-ample divisors, and let H be an ample divisor.

Following [4], we may define the slope, $\mu(\mathscr{F})$, and stability of a reflexive sheaf $\mathscr{F}$ with respect to $D_1, D_2, \dots, D_{n-1}$. See [4] for more details.

In the case where X has quotient singularities in codimension 2 (e.g., if X has Kawamata log terminal singularities), let $\hat{c}_2$ be the second Chern class of the sheaf $\hat{\Omega}^1_X$, which is a Q-sheaf in codimension 2 (see [2, Chap. 10] and [6] for more details on Q-sheaves). In fact, although [2, Chap. 10] has the explicit assumption that $\dim X = 2$, the Chern classes of the Q-sheaf $\hat{\Omega}^1_X$ are well defined in arbitrary dimension over the locus where X has quotient singularities and where the cover $\tilde{X}$, constructed by Mumford, is Cohen-Macaulay. Since the complement of this locus has codimension 3, a cycle of codimension at most 2 extends uniquely to a cycle on the whole of X. Thus $\hat{c}_2$ is a well-defined cycle on X, and for similar reasons, the cycles $c_1 = K_X$ and $c_1^2 = K_X^2$ are also well defined. In particular, the intersection numbers

$$c_1 \cdot D_1 \cdot \dots \cdot D_{n-1}, \qquad c_1^2 \cdot D_1 \cdot \dots \cdot D_{n-2}, \qquad \text{and} \qquad \hat{c}_2 \cdot D_1 \cdot \dots \cdot D_{n-2}$$

are certainly well defined.

The aim of this section is to prove the following.

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