THREE CORRECTIONS TO "G_2 AND HYPERGEOMETRIC SHEAVES"

NICHOLAS M. KATZ

(1) In the statement of Theorem 9.1, the hypergeometric sheaf named in case 5), when $p = 2$, should be

$$\mathcal{H}(\psi; all\ characters\ of\ order\ dividing\ 9\ except\ two$$
$$inverse\ characters\ of\ order\ nine; \emptyset),$$

not

$$\mathcal{H}(\psi; all\ characters\ of\ order\ dividing\ 9\ except\ two$$
$$inverse\ characters\ of\ order\ nine; \chi_{quad}).$$

(2) Replace the proof of Lemma 10.1 by the following.

Proof. Since $[7]^{\star}\mathcal{H}$ has $G_{geom} = L_2(13)$, and $[7]$ is a Galois covering of $\mathbb{G}_m \otimes \overline{k}$ by itself, the G_{geom} for $\mathcal{H}$ (lies in G_2 and) contains $L_2(13)$ as a normal subgroup. But $L_2(13)$ is its own normalizer in G_2; indeed, its normalizer is a finite primitive irreducible subgroup of G_2 which contains $L_2(13)$, so has order divisible by 13, so by classification must be $L_2(13)$. Thus $\mathcal{H}$ has $G_{geom} = L_2(13)$. So also the twist $\mathcal{F}$ has $G_{geom} = L_2(13)$. Its G_{arith}, which lies in $SO(7)$ and normalizes G_{arith}, is then a finite primitive subgroup of G_2 which contains $L_2(13)$, so again by classification must itself be $L_2(13)$. $\square$

(3) Replace the first two sentences in the proof of Lemma 10.2 by the following.

Proof. Since $[7]^{\star}\mathcal{H}$ has $G_{geom} = U_3(3)$, and $[7]$ is a Galois covering of $\mathbb{G}_m \otimes \overline{k}$ by itself, the G_{geom} for $\mathcal{H}$ (lies in G_2 and) contains $U_3(3)$ as a normal subgroup of index dividing 7. But the normalizer of $U_3(3)$ in G_2 is $U_3(3).2$; indeed, the normalizer is a finite primitive irreducible subgroup of G_2 which certainly contains $U_3(3).2$, so by classification must be $U_3(3).2$. Thus we have

$$U_3(3) \subset G_{geom} \subset U_3(3).2.$$

Date: January 24, 2016.

As the index of $U_3(3)$ in G_{geom} divides 7, it follows that $G_{geom} = U_3(3)$. So also the twist.... $\square$

PRINCETON UNIVERSITY, MATHEMATICS, FINE HALL, NJ 08544-1000, USA
E-mail address: `nmk@math.princeton.edu`