Errata to "Representations of finite groups of Lie type", LMS Student texts no. 95

June 10, 2025

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Proposition 6.1.12 is wrong (thanks to Jay Taylor for noticing that). It should read

Proposition 6.1.12 *If* $(\mathbf{L}_I, \Lambda)$ *is a cuspidal pair where* Λ *is a unipotent character (see Definition 11.3.4), then* W_I *is normalised by* w_J *for any* F*-stable* $J \subset S$ *containing* I*, where* w_J *is the longest element of the Coxeter group* W_J*;* $W_{\mathbf{G}^F}(\mathbf{L}_I)$ *is a Coxeter group with generating simple reflections the elements* $w_J w_I$ *where* $J \supset I$ *and* $J - I$ *is a single orbit under* F*.*

The proof actually proves this corrected statement.

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In the statement of Proposition 9.1.2 there is a word missing: "morphism" should be "separable morphism"; a counterexample to the statement as given is a Frobenius morphism (thanks to Pierre Deligne for noticing that).

Above Definition 9.1.3: The irreducibility (when $\mathbf{U}$ is in no F-stable proper parabolic subgroup) is for the variety $\mathbf{X}_\mathbf{U}/\mathbf{L}^F$, not for $\mathbf{X}_\mathbf{U}$.

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The assertion that there is no noncentral quasi-isolated element in ${}^2G_2$ is false (thanks to Gunter Malle for noticing that). There is such an element of order 2 such that $C_{\mathbf{G}^*}(s)$ is connected of type $A_1 \times A_1$ where F^* exchanges the 2 components. One can deduce Lusztig's Jordan decomposition by using

- the character table of ${}^2G_2(3^{2r+1})$ in

  H. N. Ward, "On Rees's series of simple groups", *Trans. Amer. Math. Soc.* **21**(1966), pp 62–89.

- the centralizers of semi-simple elements and irreducible characters of ${}^2G_2(3^{2r+1})$ in Lemmas 8.2.2 and 8.2.3, in particular 8.2.3 (b) in

  G. Hiss, "Zerlegungszahlen endlicher Gruppen vom Lie-Typ in nicht-definierender Charakteristik" *Habilitationschrift, Aachen* (1990)

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The function $R_{(1,\varepsilon)}$ is equal to $\eta q^2 \mathcal{Y}_{(G_2(a_1),\varepsilon)}$ where $\eta = \pm 1$ is equal to $q \pmod 3$. Consequently table 14.2 is wrong.

The values of unipotent characters of G_2 on unipotent classes ($p \neq 2, 3$):

	1	A_1	$\tilde{A}_1$	$G_2(a_1)_3$	$G_2(a_1)_2$	$G_2(a_1)$	G_2
$\mathbf{1}$	1	1	1	1	1	1	1
St	q^6	.	.	.	.	.	.
σ	$\frac{q}{3}\Phi_3\Phi_6$	$-\frac{q}{3}\Phi_1\Phi_2$	q	$\frac{q}{3}(\eta q+5)$	$-\frac{q}{3}(\eta q-1)$	$\frac{q}{3}(\eta q-1)$	.
τ	$\frac{q}{3}\Phi_3\Phi_6$	$\frac{q}{3}(2q^2+1)$	.	$\frac{q}{3}(\eta q-1)$	$-\frac{q}{3}(\eta q-1)$	$\frac{q}{3}(\eta q+2)$	.
ρ	$\frac{q}{6}\Phi_2^2\Phi_3$	$\frac{q}{6}(2q+1)\Phi_2$	$\frac{q}{2}\Phi_2$	$\frac{q}{6}(\eta q+5)$	$-\frac{q}{6}(\eta q-1)$	$\frac{q}{6}(\eta q-1)$	.
ρ'	$\frac{q}{2}\Phi_2^2\Phi_6$	$\frac{q}{2}\Phi_2$	$\frac{q}{2}\Phi_2$	$-\frac{q}{2}(\eta q-1)$	$\frac{q}{2}(\eta q+1)$	$-\frac{q}{2}(\eta q-1)$	.
$\gamma_{[-1]}$	$\frac{q}{2}\Phi_1^2\Phi_3$	$-\frac{q}{2}\Phi_1$	$-\frac{q}{2}\Phi_1$	$-\frac{q}{2}(\eta q-1)$	$\frac{q}{2}(\eta q+1)$	$-\frac{q}{2}(\eta q-1)$	.
$\gamma_{[1]}$	$\frac{q}{6}q\Phi_1^2\Phi_6$	$\frac{q}{6}(2q-1)\Phi_1$	$-\frac{q}{2}\Phi_1$	$\frac{q}{6}(\eta q+5)$	$-\frac{q}{6}(\eta q-1)$	$\frac{q}{6}(\eta q-1)$	.
$\gamma_{[\zeta_3]}$	$\frac{q}{3}\Phi_1^2\Phi_2^2$	$-\frac{q}{3}\Phi_1\Phi_2$	.	$\frac{q}{3}(\eta q-1)$	$-\frac{q}{3}(\eta q-1)$	$\frac{q}{3}(\eta q+2)$	.
$\gamma_{[\zeta_3^2]}$	$\frac{q}{3}\Phi_1^2\Phi_2^2$	$-\frac{q}{3}\Phi_1\Phi_2$	.	$\frac{q}{3}(\eta q-1)$	$-\frac{q}{3}(\eta q-1)$	$\frac{q}{3}(\eta q+2)$	.