CORRECTIONS TO *EXPONENTIAL SUMS AND DIFFERENTIAL EQUATIONS*

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Corrections to Chapter 7

page 232, line 6: "7.40.4" should be 7.10.4

page 247, last 3 lines: They are false. They should be replaced by the following discussion:

> If the sign, call it ϵ, is $+1$, or if N is odd and the sign is -1, then we can directly apply Deligne's general theorem to the slightly twisted sheaf $(\epsilon)^{deg} \otimes \mathcal{G}(1/2)$ with $G_{geom} = SO(N)$. If, however, N is even and $\epsilon = -1$, then the situation is more complicated. The Frobenii attached to points of even degree will still be approximately equidistributed in the space of conjugacy classes of a compact form of $SO(N)$. However, the Frobenii attached to points of odd degree will be approximately equidistributed according to a different law. For $O(N, \mathbb{R})$ a compact form of the full orthogonal group $O(N)$, and
>
> $$O(N, \mathbb{R}) = SO(N, \mathbb{R}) \amalg O_{-}(N, \mathbb{R})$$
>
> its usual expression as a union of two $SO(N, \mathbb{R})$-cosets, the Frobenii attached to points of odd degree will be approximately equidistributed in the space of $O(N, \mathbb{R})$-conjugacy classes of the "other" coset $O_{-}(N, \mathbb{R})$. See [Ka-Sar-RMFEM, 7.9.10] for the general form of Deligne's result that we need here, and see [Ka-TLFM, 7.4.14] for a concrete discussion of its application in the sort of situation we have here.

Corrections to Chapter 8

page 252, line 10 of (8.1.4) is false. The functor $j_{!\star}$ is not exact, it is only "end-exact", i.e., it carries injections to injections, and surjections to surjections, cf. [Ka-RLS, 2.17.1].

Corrections to Chapter 9

page 320, line 6 of proof of 9.1.1 should read

$$p > 2rank(\mathcal{G}) + 1 = 15.$$

Corrections to Chapter 10

page 332, penultimate line of 10.0: replace "rather that giving" by "rather than giving".

page 333, line 3: replace "casess" by "cases".

page 350, lines -7 and -6: Assertion (3) of 10.8.1 should read

(3) There exists an isomorphism of lisse sheaves

$$\mathcal{H} \otimes T^{\star}_{\zeta_1}\mathcal{H} \otimes T^{\star}_{\zeta_2}\mathcal{H} \cong [3]^{\star}\mathcal{H}_{\mu}(!, \psi, \rho_1, \ldots, \rho_8; \Lambda_{1/4}, \Lambda_{3/4}).$$

Corrections to Chapter 14

page 418, line 5 of 14.13.3: should read "a monic polynomial $g(x) \in R[x]$..." and not "a monic polynomial $f(x) \in R[x]$". This error is confusing, since $f : X \to \mathbb{A}^1_R$ is our function on X.

page 418, statement of 14.13.3: This is contaminated by this same error. Its first paragraph should read

Proposition. 14.13.3 (Gabber) *Let R Let R be a subring of $\mathbb{C}$ which is a finitely generated $\mathbb{Z}[1/\ell]$-algebra. Let X/R be an affine R-scheme which is smooth over R, everywhere of relative dimension $d \geq 0$. Let*

$$f : X \to \mathbb{A}^1_R$$

be a function on X, viewed as a morphism to $\mathbb{A}^1_R$. Suppose given a stratification $(\mathbb{A}^1_R - D, D)$ of $\mathbb{A}^1_R$, where $D \subset \mathbb{A}^1_R$ is a divisor which is finite etale over R of some degree $\delta \geq 1$, defined by a monic polynomial $g(x) \in R[x]$ of degree δ whose discriminant Δ is a unit in R, such that for any lisse $\overline{\mathbb{Q}_\ell}$-sheaf $\mathcal{G}$ on X, the objects $Rf_!\mathcal{G}$ and $Rf_\star\mathcal{G}$ of $D^b_c(\mathbb{A}^1_R, \overline{\mathbb{Q}_\ell})$ are both adapted to $(\mathbb{A}^1_R - D, D)$, and their formation commutes with arbitrary change of base on $Spec(R)$ to a good scheme.

References

[Ka-RLS] Katz, Nicholas M., Rigid local systems. Annals of Mathematics Studies, 139. Princeton University Press, Princeton, NJ, 1996. viii+223 pp.

[Ka-TLFM] Katz, Nicholas M., Twisted L-functions and monodromy. Annals of Mathematics Studies, 150. Princeton University Press, Princeton, NJ, 2002. viii+249 pp.

[Ka-Sar-RMFEM] Katz, Nicholas M., Sarnak, Peter, Random matrices, Frobenius eigenvalues, and monodromy. American Mathematical Society Colloquium Publications, 45. American Mathematical Society, Providence, RI, 1999. xii+419 pp.

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