Errata and complementary remarks for:

Cohomology of Number Fields second ed. (2008) (by J. Neukirch, A. Schmidt, K. Wingberg)

This file lists a number of mistakes in the second edition and gives some remarks on the text which either did not find their way into the book, or refer to results which were proven after the book was written.

This file is not maintained anymore. If you find a mistake not listed below or have a comment, please have a look at the free online edition and its errata-file, available on my homepage.

-p. 36, l. 13 (noticed by L. Wan) replace 'exercise 4' by 'exercise 3'.

-p. 42, l.2 (noticed by J. Gärtner) replace 'homomorphisms' by 'bilinear maps'.

-p. 42, l.-2, p. 43, l.8 and l. 14 (noticed by J. Gärtner) replace '$\times$' by '$\otimes$'.

-p. 61, l.5 (noticed by Z. Chen) replace 'open' by 'closed'.

-p. 90, l. 17 (noticed by L. Wan) change A to A' in the last term.

-p. 94, l. -1 (noticed by L. Wan) replace '$\xrightarrow{\delta} \hat{H}^0(G,A) \to \hat{H}^0(G,B) \to \hat{H}^0(G,C)$' by '$\xrightarrow{\delta} \hat{H}^0(G,A') \to \hat{H}^0(G,A) \to \hat{H}^0(G,A'')$'.

-p. 100, l. 10 remove the second 'if' (to avoid logical confusion).

-p. 101, l. 17 (noticed by T. Wunder) replace '$f^{n+1} \circ d^n = d^{n+1} \circ f^n$' by '$f^{n+1} \circ d^n = d^n \circ f^n$'.

-p. 106, l. 4 (noticed by L. Wan) replace 'below' by 'above'.

-p. 107, l. 17 (noticed by L. Wan) replace 'A^{n-1}' by '0'.

-p. 109, l. 7 (noticed by L. Wan) replace 'A^{2p+q+1}' by 'A^{p+q+1}'.

-p. 113, l. -3 (noticed by L. Wan) replace '$x_{1,\sigma} - b_{1,\sigma}(\sigma)$' by '$x_{1,\sigma} + b_{1,\sigma}(\sigma)$'.

-p. 117, l. 3 (noticed by L. Wan) replace '$d_2^{0,1}(z)$' by $d_2^{0,1}(\varepsilon)$'.

-p. 157, l. -4 (noticed by T. Wunder): missing comma: replace '$\varprojlim_{U\ def}$' by '$\varprojlim_{U,\ def}$'.

-p. 165, l. -4 (noticed by A. Leesch) replace '0' by '1'.

-p. 178, l. -9 (noticed by J. Stix) replace 'X^{n+1}' by 'X^{n-1}'.

-p. 180, l. -11 (noticed by P. Barth) replace 'open neighbourhoods of the identity element' by 'open subgroups'.

-p. 181, l. 11 (noticed by P. Barth) replace '$cd\, G = n$' by '$cd\, G \le n$'.

-p. 181, l. 16 (noticed by P. Barth) add the assumption $cd_p\, G/H < \infty$ in exercise 4.

-p. 187 proof of (3.4.7) (noticed by J. Stix) replace the exponent n (resp. $n+1$ and $n-1$) of p by m (resp. $m+1$ and $m-1$).

-p. 191, l. -6 (noticed by P. Barth) replace 'an' by 'a'.

-p. 197, l. 5 (noticed by L. Wan) replace '$\psi'(\sigma)\psi^{-1}(\sigma)$' by '$\psi'(\sigma)\psi(\sigma)^{-1}$'.

-p. 204, l. -11 (noticed by L. Wan) replace '$\#U/V = p^{n-1}$' by '$\#U/W = p^{n-1}$'.

-p. 205, l. 1–3. (noticed by L. Wan) replace the text following 'otherwise' by '$1 = p^{n-1}u_{U/V} = p^{n-2}i(u_{U/W})$ by (3.6.1). As i is injective, this implies $p^{n-2}u_{U/W} = 1$, contradicting the induction hypothesis.

-p. 210, l. -1 (noticed by L. Wan) replace 'scd' by 'scd_p' (twice).

-p. 210, l. 10 replace 'II §1' by 'II §5'.

-p. 213, l. 10 see Theorem 1 of our paper Extensions of profinite duality groups for the most general version of Theorem 3.7.4 known to us.

-p. 213, l. -12 replace '$E_2^{ij}(h,A)$' by '$E_2^{ij}(g,h,A)$'.

-p. 213, l. -8 replace 'see II §1, ex.4' by 'see II §4, ex.3'.

-p. 214, l. 4 replace '$\varinjlim_{g} \varinjlim_{h'}$' by '$\varinjlim_{h'} \varinjlim_{g/h}$'.

-p. 224 ff. (noticed by P. Barth) There is sloppy notation in the whole section III, §9. A generator system is not a *subset* $S \subseteq G$, but a family $S = (g_i)_{i \in I}$ of elements of G. Otherwise several statements of this section become incorrect as they stand.

-p. 224 l. -3 Replace 'generators' by 'generator'.

-p. 226, l. -7 (noticed by Z. Chen) replace 'In this case' by 'If $\mathscr{R}$ is finite and minimal'.

-p. 227, l. 12 replace 'open neighbourhoods of the identity element' by 'open subgroups'.

-p. 229, l. -4 (noticed by P. Barth) replace 'Equivalently' by 'It follows that'.

-p. 235, l. 15 (noticed by J. Gärtner) replace '$\chi_1 \cup \chi_2$' by '$\chi_k \cup \chi_l$'.

-p. 248, l. 15 (noticed by P. Barth) correct this line to

$$0 \to A^G(\mathfrak{c}) \to A(\mathfrak{c}) \to \bigoplus_{i \in I} (A/A^{G_i})(\mathfrak{c}) \xrightarrow{\delta} H^1(G,A) \xrightarrow{\text{res}} \bigoplus_{i \in I} H^1(G_i,A) \to 0.$$

-p. 264, l. -7 (noticed by P. Barth) correct this line to

$$0 \to A^G(\mathfrak{c}) \to A(\mathfrak{c}) \to \bigoplus_{t\in T}{}' (A/A^{G_t})(\mathfrak{c}) \xrightarrow{\delta} H^1(G,A) \xrightarrow{\text{res}} \bigoplus_{t\in T}{}' H^1(G_t,A) \to 0.$$

-p. 277, l. 7 (noticed by P. Barth) replace 'and' by 'which'.

-p. 284, l. 11 (noticed by M. Witte) It is not true in a general (noncommutative) ring that any nilpotent element is contained in the radical. Hence here is a gap in the argument which can be filled as follows. We start with the following observation: let K be a field of characteristic $p > 0$ and let P be a finite p-group. Then (same argument as in the proof 1.6.13), K with trivial P-action is the only simple left $K[P]$-module. Hence the augmentation ideal in $K[P]$ is the only left maximal ideal and thus equal to the radical. Since the radical of an artinian ring is nilpotent, we find a natural number n such that $\prod_{i=1}^n (x_i - 1) = 0$ in $K[P]$ for any elements $x_1, \ldots, x_n \in P$.

Now we return to the proof of 5.2.16 c)⇒a). Using the identity $g(u-1)g'(u'-1) = gg'((g')^{-1}ug' - 1)(u'-1)$ and the observation above, we conclude that the image of $a(u-1)$ in $\mathcal{O}/\mathfrak{m}[G/V]$ is nilpotent for any $a \in \mathcal{O}[\![G]\!]$, $u \in U$. Hence the image of $1 - a(u-1)$ is unit for any a, and so $u - 1$ is contained in the radical of $\mathcal{O}/\mathfrak{m}[G/V]$.

-p. 298, l. 5 (noticed by A. Leesch) one should not use T as the variable of the characteristic polynomial of the endomorphism T: replace 'T^λ' by 'X^λ'.

-p. 337, l.-8 (noticed by Z. Chen) '(1.6.2)(c)' is a more precise reference than '(1.6.1)'.

-p. 341, l.2ff (noticed by N. Naumann) The map $\wp := F - \mathrm{id}$ is not given explicitly as written here (addition in W_n is not component-wise). Furthermore, one needs the assumption that R is an integral domain in order to conclude that $W_n(\mathbb{F}_p) \cong \mathbb{Z}/p^n\mathbb{Z}$ is the kernel of $\wp : W_n(R) \to W_n(R)$.

-p. 341, l.13 (noticed by N. Naumann) The surjectivity of $\wp : W_n(\bar{K}) \to W_n(\bar{K})$ in the sequence $(*)$ is obvious only in the case $n = 1$. For $n > 1$ one can argue by induction using the exact diagram

$$\begin{tikzcd}
0 \arrow[r] & W_n(\bar{K}) \arrow[r, "V"] \arrow[d, "\wp"] & W_{n+1}(\bar{K}) \arrow[r] \arrow[d, "\wp"] & W_1(\bar{K}) \arrow[r] \arrow[d, "\wp"] & 0 \\
0 \arrow[r] & W_n(\bar{K}) \arrow[r, "V"] & W_{n+1}(\bar{K}) \arrow[r] & W_1(\bar{K}) \arrow[r] & 0.
\end{tikzcd}$$

-p. 358, l.8 'replace 'X^n' by 'X^N'.

-p. 358, l.16,17 (noticed by Z. Chen) add the subscript 'F_i' to '$(1-a_i, a_i)$' and '$(1-a_i, a_i^N)$'.

-p. 358, l. -8 The Bloch-Kato conjecture has been proven in the meantime, see [Vo].

-p. 359, l.17 (noticed by Z. Chen) replace 'K' by 'F'.

-p. 367, l. 12 (noticed by L. Wan) replace 'algebraic' by 'separable'.

-p. 369, l. 7 (noticed by J.-L. Colliot-Thélène) In fact, this is known: $\mathbb{Q}_p$ is not C_i for any i, see [AK] (see also the review of D. Coray in mathscinet). In contrast, notice that the fields $\mathbb{F}_p((X))$ are C_2, see [60], Cor. 4.9.

-p. 369, l.12 (we forgot to update this sentence) A proof of the Milnor conjecture has been published by Voevodsky in [242], [243] (cf. (6.4.4)(ii))

-p. 371, l. -9 (noticed by A. Leesch) replace '0' by '1'.

-p. 376, l. 4 (noticed by T. Keller) replace 'III §1 ex. 5' by 'III §1 ex. 4'

-p. 377, l. 3–5 (noticed by T. Keller) replace these lines by
'together with $cd_p\Gamma = 1$ yields by (2.1.4)

$$H^{i+1}(k,A) \cong H^i(\Gamma, H^1(\tilde{k},A)) = 0 \text{ for } i \geq 2,$$

hence $cd_p(k) \leq 2$.'
Furthermore, it would be quicker to refer to (3.3.8) in order to conclude that $cd_p(k) \leq 2$.

-p. 393, l. 12ff (noticed by J. Stix) The proof of (i) is incorrect (A is not an $\mathbb{F}_\ell[G]$-module). Replace the proof by the following:
Proof: We prove (ii) first. Using a filtration of V/W by $\mathbb{Z}_\ell[G]$-modules such that the subquotients are $\mathbb{F}_\ell[G]$-modules, we may assume that V/W is an $\mathbb{F}_\ell[G]$-module. Consider the diagram

$$\begin{tikzcd}
0 \arrow[r] & W \arrow[r] \arrow[d, "\ell"'] & V \arrow[r] \arrow[d, "\ell"'] & V/W \arrow[r] \arrow[d, "\ell"'] & 0 \\
0 \arrow[r] & W \arrow[r] & V \arrow[r] & V/W \arrow[r] & 0.
\end{tikzcd}$$

The snake lemma gives the exact sequence

$$0 \longrightarrow {}_\ell W \longrightarrow {}_\ell V \longrightarrow V/W \longrightarrow W_\ell \longrightarrow V_\ell \longrightarrow V/W \longrightarrow 0,$$

and hence the result. Assertion (i) follows by applying (ii) to $V = A$, $W = 0$.

-p. 395, proof of (7.3.4) (noticed by L. Yongqi) Delete the sentence starting in line -13 and then argue as follows: Let $H = H^{(\ell')} \times H_\ell$ be a cyclic subgroup of G where H_ℓ is the ℓ-Sylow subgroup of H. Let M be a simple $\mathbb{F}_\ell[H]$-module. By (1.6.13), $M^{H_\ell} \neq 0$. Since M^{H_ℓ} is also an H-module, we obtain $M = M^{H_\ell}$, hence an isomorphism of $\mathbb{F}_\ell[H]$-modules

$\mathrm{Ind}_H^{H^{(\ell')}}\mathrm{Res}^H_{H^{(\ell')}} M \cong M \otimes_{\mathbb{Z}} \mathbb{F}_\ell[H_\ell]$. Therefore the class of $\mathrm{Ind}_H^{H^{(\ell')}}\mathrm{Res}^H_{H^{(\ell')}} M$ in $K_0'(\mathbb{F}_\ell[H])$ is $n[M]$, where $\#H_\ell = \ell^n$, and so the images of $K_0'(\mathbb{F}_\ell[H]) \otimes \mathbb{Q}$ and $K_0'(\mathbb{F}_\ell[H^{(\ell')}]) \otimes \mathbb{Q}$ under $\mathrm{Ind} \otimes \mathbb{Q}$ in $K_0'(\mathbb{F}_\ell[G]) \otimes \mathbb{Q}$ are the same.

-p. 398, l. -8 ff (noticed by T. Keller) In (7.3.8) replace '$\mathbb{Z}_p$' by '$\mathbb{Z}_\ell$' (4 times). In the proof replace all 'p' by 'ℓ'.

-p. 400, l. -3 (noticed by L. Wan) Remove the twist in the exact sequence (or add two further twists).

-p. 427, l. 15,16 (noticed by L. Wan) Replace '$\ell^{[\mathbb{F}_\ell(\mu_{2^r})\cap k:\mathbb{F}_\ell]\cdot r} \equiv -1 \bmod 2^r$ for some $r \in \mathbb{N}$' by '$\ell^{[\mathbb{F}_\ell(\mu_{2^r})\cap k:\mathbb{F}_\ell]\cdot n} \equiv -1 \bmod 2^r$ for some $n \in \mathbb{N}$' (double use of 'r').

-p. 433, l. 7 (noticed by L. Wan) In the middle term replace '$cor_k^K(c)$' by '$cor_k^K(c)_\mathfrak{p}$'.

-p. 436, l. 10 ff (noticed by D. Harari and G. Kings) The last argument of the proof uses the fact that $(a, K|k) = 1$ for $a \in k^\times$, a result which we do not have at hand at this moment. To avoid a 'flavour of circularity', the last paragraph should be replaced by the following:

"It remains to show that inv is trivial on the image of $H^2(G, K^\times)$. We prove this without the assumption of $K|k$ being cyclic. So let $\alpha \in Br(k)$ be arbitrary. If k is a function field, then, by (8.1.14) and the following remark, we may assume that $\alpha \in Br(K|k)$, where $K = k(\zeta_n)$ for some n prime to $\mathrm{char}(k)$. If k is number field, let K be a finite extension of k which is Galois over $\mathbb{Q}$ and such that $\alpha \in Br(K|k)$. Then $inv_k(\alpha) = inv_{K|k}(\alpha) = inv_{K|\mathbb{Q}}(cor_{\mathbb{Q}}^k \alpha)$. Hence we may assume that $k = \mathbb{Q}$ and, by the same argument as in the function field case, $\alpha \in Br(K|\mathbb{Q})$ for a cyclic subextension K of $\mathbb{Q}(\zeta_n)|\mathbb{Q}$ for some n. In both cases, let $G = G(K|k)$ and let χ be a generator of $H^1(G, \mathbb{Q}/\mathbb{Z})$. Then $\delta\chi$ is a generator of $H^2(G, \mathbb{Z})$, and the cup-product

$$\delta\chi\cup\ : \hat{H}^0(G, K^\times) \longrightarrow H^2(G, K^\times)$$

is the periodicity isomorphism (see (1.7.1)). Hence every element of $H^2(G, K^\times)$ is of the form $\bar{a} \cup \delta\chi$ with $a \in k^\times$. By (8.1.11), we have

$$inv_{K|k}(\bar{a} \cup \delta\chi) = \chi((a, K|k)).$$

It therefore remains to show that $(a, K|k) = 1$ for $a \in k^\times$. Hence it suffices to show that $(a, k(\zeta_n)|k)\zeta_n = \zeta_n$, where k is a function field and $(n, \mathrm{char}(k)) = 1$ or $k = \mathbb{Q}$ and n arbitrary. Let k be a function field. Then, for any place $\mathfrak{p}$ of k, we have $(a, k_\mathfrak{p})\zeta_n = \zeta_n^{\#k(\mathfrak{p})^{v_\mathfrak{p}(a)}}$. The 'product formula' yields $\prod_\mathfrak{p} \#k(\mathfrak{p})^{v_\mathfrak{p}(a)} = 1$, hence $(a, k)\zeta_n = \zeta_n^{\prod_\mathfrak{p} \#k(\mathfrak{p})^{v_\mathfrak{p}(a)}} = \zeta_n$. The argument in the case $k = \mathbb{Q}$ is similar, but the computation of the local norm residue symbols at the primes $p \mid n$ is much more involved, see, e.g., [160], VI, (5.3). This proves the proposition."

-p. 452, l. 12 (noticed by L. Wan) $d(\alpha)$ is not always -1 as asserted, but ± 1. Put $f = X^p - X - a$. We have $d(\alpha) = \mathrm{disc}(f) = (-1)^{p(p-1)/2}\mathrm{Res}(f, f') = \begin{cases} -1 & \text{if } p \equiv 1 \bmod 4 \\ +1 & \text{else.} \end{cases}$

-p. 456, l. 12 (noticed by M. Sigl) replace 'is 1 or 2' by 'is of order 1 or 2'.

-p. 457, l. 8 replace '$\mu_{p\infty}$' by 'μ_{p^∞}'.

-p. 464, l. 12 (noticed by M. Sigl) replace '$\mathcal{O}_S^\times(k)$' by '$\mathcal{O}_{k,S}^\times$' (twice).

-p. 482, l. -2 (noticed by M. Sigl) replace 'three' by 'two'.

-p. 487, (8.6.9) If S is the set of all places, then (8.6.9) holds for an arbitrary finitely generated G_k-module A. This fact together with the proof below was told us by J.-L. Colliot-Thélène. One uses the following fact: there exists an exact sequence $0 \to C \to B \to A \to 0$ with B torsionfree and $C \cong \bigoplus_{i=1}^n \mathrm{Ind}_{G_k}^{U_i} \mathbb{Z}$, where $U_i \subset G_k$ are open subgroups; see [CS], Lemma 0.6. As the groups $H^1(k, C)$, $H^1(k, C')$, $Ш^2(k, C)$ and $Ш^2(k, C')$ vanish, we obtain isomorphisms $Ш^1(k, B) \cong Ш^1(k, A)$ and $Ш^2(k, B') \cong Ш^2(k, A')$, and so the statement for general A follows from that in the torsionfree case. This argument extends to the case when S has Dirichlet density 1.

-p. 488, l. 5 replace 'H' by '$Ш$' (twice)

-p. 491, l. 1 (noticed by L. Wan) The diagram is erroneous and the argument should be replaced by the following: Consider the canonical injections

$$\bigoplus_{\mathfrak{p} \in S \setminus T(k)} H^1(k_\mathfrak{p}, A)/H^1_{nr}(k_\mathfrak{p}, A) \hookrightarrow \bigoplus_{\mathfrak{p} \in S \setminus T(k)} H^1(T_\mathfrak{p}, A) \overset{diag}{\hookrightarrow} \prod_{\mathfrak{P} \in S \setminus T(k_T)} H^1(T_\mathfrak{P}, A),$$

where $T_\mathfrak{p}$ denotes the inertia group of the local group $G(\bar{k}_\mathfrak{p}|k_\mathfrak{p})$ for a prime $\mathfrak{p}$. We obtain the commutative and exact diagram

$$\begin{tikzcd}
H^1(G(k_S|k_T), A) \arrow[r] & \prod_{\mathfrak{P} \in S \setminus T(k_T)} H^1(T_\mathfrak{P}, A) \\
H^1(G_S, A) \arrow[r] \arrow[u] & P^1(G_S, A) \arrow[u] \\
H^1(G_T, A) \arrow[r] \arrow[u, hook] & P^1(G_T, A) \times \prod_{\mathfrak{p} \in S \setminus T(k)} H^1_{nr}(k_\mathfrak{p}, A) = P_T. \arrow[u, hook]
\end{tikzcd}$$

Since A is a trivial $G(k_S|k_T)$-module and since the images of the inertia groups $T_\mathfrak{P}$, $\mathfrak{P} \in S \smallsetminus T(k_T)$, generate $G(k_S|k_T)$ as a normal subgroup, the upper horizontal map is injective. Thus ...

-p. 501, l. 5 (noticed by L. Wan) replace '$H^2(G_S, T)^\vee$' by '$H^1(G_S, T)^\vee$'.

-p. 523, l. 3 (noticed by J. Stix) replace 'its' by 'it is'.

-p. 523, l. 8 (noticed by T. Keller) replace 'K' by 'k'.

-p. 524, l. -2 (noticed by O. Thomas) replace '$cs(\Omega|k))$' by '$cs(\Omega|k)$'.

-p. 525, l. 9 (noticed by O. Thomas) replace '$s \cdot v_p(r)$' by '$s + v_p(r)$'.

-p. 525, l. 11 (noticed by O. Thomas) replace '$\mathrm{im}(U^1)$' by '$\mathrm{im}(U^1 \to (\mathbb{Z}/p^m\mathbb{Z})^\times)$'.

-p. 525, l. 12 (noticed by O. Thomas) replace '(i)' by 'the first statement'.

-p. 526, l. -10 replace '*char(k)*' by 'char(k)' (false fonts).

-p. 527, l. -5 (noticed by F. Klössinger) replace 'by' by 'be'.

-p. 529, l. 5 (noticed by O. Thomas) replace '$cs(\Omega|k))$' by '$cs(\Omega|k)$'.

-p. 533, l. -5 (noticed by J. Stix) replace 'this trivially' by 'this is trivially'.

-p. 534, l. -1 (noticed by F. Klössinger) replace 'Tat' by 'Tate'.

-p. 535, ex. 1 we forgot to modify this exercise after changing terminology in the second edition. Make the following changes: T should not be finite, but the complement of a finite set of primes (this can be weakened to $\delta(T) > 1/2$) and replace 3) by

$$\{\mathfrak{p} \mid \mathfrak{p} \text{ divides 2 and } -1, 2+\eta_s, -(2+\eta_s) \text{ are not squares in } k_{\mathfrak{p}}\} \cap T = \varnothing.$$

-p. 539, l. -2 (noticed by C. D. Gonzalez-Aviles) Remove the zeroes on the left hand side of the diagram.

-p. 553, l. -2 (noticed by P. Barth) replace '$k_{i+1}|k$' by '$k_{i+1}|k_i$'.

-p. 602, l. -6 (noticed by M. Witte) replace '$\prod\limits_{\ell\neq p}(\mathbb{Q}_\ell/\mathbb{Z}_\ell)^{2g} \oplus (\mathbb{Q}_p/\mathbb{Z}_p)^h$' by '$\bigoplus\limits_{\ell\neq p}(\mathbb{Q}_\ell/\mathbb{Z}_\ell)^{2g} \oplus (\mathbb{Q}_p/\mathbb{Z}_p)^h$'.

-p. 604 l.16 (noticed by T. Keller) replace 'chap.IV, §4' by 'chap.IV, §2'.

-p. 607 l.17 (noticed by T. Keller) replace '$i \in \mathbb{Z}$' by '$i > 0$'.

-p. 615 l.-10 (noticed by T. Keller) replace '$G_\varnothing(K\bar{k})$' by '$G_\varnothing(K\bar{k})(p)$' (twice).

-p. 634, l. -4 (noticed by P. Barth) replace '$r_1(K) + r_2(K)$' by '$r_1(k) + r_2(k)$'.

-p. 635, l. 1 (noticed by P. Barth) add 'be algebraic over $\mathbb{Q}$' after '$\alpha_1, \ldots, \alpha_n \in \mathbb{C}_p^\times$.

-p. 643 l. 9 (noticed by J. Bartels) replace '$i \geq 1$' by '$i \geq 2$'.

-p. 644 l. 7 replace 'finite field' by 'finite number field'.

-p. 649, l. 1 (noticed by P. Barth) replace '(10.4.2)' by '(10.4.4)'.

-p. 650 l. 11 replace 'G' by '$G(k_S|k_\infty)$'.

-p. 651, l. 1 (noticed by P. Barth) replace 'H^1' by '$\dim_{\mathbb{F}_p} H^1$'.

-p. 674 l. -7 (noticed by A. Matar) replace '$\sum\limits_{i=1}^{2}$' by '$\sum\limits_{i=0}^{2}$'.

-p. 675 l.5 (noticed by O. Thomas) replace '*char*' by 'char' (false font).

-p. 676, l. -13 (noticed by P. Barth) unfortunately, the definition of $S_{\min}$ has not given yet, but can be found at the beginning of X §10 on page 698.

-p. 676 l. -2 (noticed by J. Gärtner) replace 'if $\infty \in S$ or $\ell \in S$' by 'if $2 \in S$, $\infty \in S$ or $\ell \in S$'. Furthermore, the α in line -7 is redundant (because it is zero).

-p. 686 (10.8.5) (noticed by A. Ivanov) The correct statement of Chenevier's theorem is the injectivity of $G_{k_{\mathfrak{p}}} \to G_{S_\ell \cup \{\mathfrak{p},\bar{\mathfrak{p}}\}}$. A newer and sharper result of Chenevier/Clozel [CC] states that, even without assuming that $\mathfrak{p}_0$ splits, the map $G_{k^+_{\mathfrak{p}_0}} \to G_{S_\ell \cup \{\mathfrak{p}_0\}}(k^+)$ is injective.

-p. 688, l. 8 (noticed by P. Barth) replace '(7.1.8)(i)' by '(7.2.5)'.

-p. 697 l.12 replace '$K^+_{\mathfrak{p}}$' by '$k^+_{\mathfrak{p}}$' and 'K^+' by 'k^+'.

-p. 697 l.14 replace '§6' by '§8'.

-p. 697 l.15 unfortunately, the definition of $S_{\min}$ has not given yet, but can be found at the beginning of X §10 on page 698. Furthermore, replace 'all these primes locally contain a p-th root of unity' by '$k_{\mathfrak{p}}$ contains a primitive p-th root of unity for all primes $\mathfrak{p} \in S(k)$'.

-p. 700 l.17 (noticed by O. Thomas) replace '$U^\times_{\mathfrak{P}}$' by '$U_{\mathfrak{P}}$'.

-p. 792, l. -2,-1 (noticed by Martin Sigl) replace 'group' by 'set' (twice).

-p. 800, l. -11 (noticed by T. Keller) remove the blank before '?'.

Remarks on the bibliography

[25] has appeared in Comp. Math. **143** (2007) 1359–1373

[38] the correct title is 'The group of the maximal p-extension of a local field' (in Russian)

[45] add blanks before KOCHLOUKOVA and ZALESSKII (noticed by T. Keller)
[60] replace 'of' by 'on'
[76] replace 'SZAMUELI' by 'SZAMUELY'
[99] replace '71–78' by '71–98' (noticed by T. Keller)

Additional references

[AK] Arkhipov, G. I.; Karatsuba, A. A. *Local representation of zero by a form*. (Russian) Izv. Akad. Nauk SSSR Ser. Mat. 45 (1981), no. 5, 948–961. English translation in Math. USSR, Izv. **19** (1982), 231–240

[CC] Chenevier, G.; Clozel, L. *Corps de nombres peu ramifiés et formes automorphes autoduales*. J. Amer. Math. Soc. **22** (2009), no. 2, 467–519

[CS] Colliot-Thélène, J.-L., Sansuc, J.-J. *Principal homogeneous spaces under flasque tori: applications*. J. Algebra **106** (1987), no. 1, 148–205

[Vo] Voevodsky, V. *On motivic cohomology with Z/l-coeffcients*. Ann. of Math. **174** (2011), 401–438

last update: January 22, 2013 by **Alexander Schmidt**