Shifted convolution sums and subconvexity bounds for automorphic $L$-functions, IMRN 2004, 3905-3926

- first display in Section 4 should read $\lambda \gg Q^2/(Nm_{\ell^2})^{1+\varepsilon}$


- p.17: the first term of the last line of the display after (4.7) should be $2^{3\nu/2} m^{1/4}$, and this inequality holds for $2^\nu \leq \min(w^2, m^{3/8})$. To cover the remaining range, one can use Lemma 4.4 instead of Lemma 4.1a in the next display getting
  
  \begin{align*}
  r(f_1, 2^{2\nu} m) - r(f_2, 2^{2\nu} m) \\
  \ll (Nm^{2\nu})^\varepsilon HN^{3\nu/2} + N(m^{1/4}vw + m^{13/28}(vw)^{3/14}) \\
  \ll HN^{7/2+\varepsilon}(2^{2\nu} m)^{13/28+\varepsilon}
  \end{align*}

if $2^\nu \geq \max(w^{1/2}, w^{7/3}m^{-1/2})$. This extra estimate is not necessary if one uses Proposition 2.1 in [Ternary quadratic forms..., CRM lecture notes 46 (2008), 1-17].

Rankin-Selberg $L$-functions on the critical line, Manuscr. Math. 117 (2005), 111-133

- (3.1) should read: $\lambda \gg Q^2/(L^{1+\varepsilon})$


- second last display on p.7: the Eisenstein series are wrongly defined. It should be
  
  \[ E_a(z; s) := \sum_{\gamma \in \Gamma \backslash \Gamma} \overline{\vartheta}(\gamma) j(\gamma z)^{-k} j(\sigma_a^{-1}, \gamma z)^{-k} |j(\sigma_a^{-1}, \gamma, z)|^k (3\sigma_a^{-1} \gamma z)^s \]

where $\vartheta(\gamma) = \chi(d) \epsilon_d^{-1}(\frac{\xi}{d})$ and $j(\gamma, z) = cz + d$.

Ternary quadratic forms and sums of three squares with restricted variables, CRM lecture notes 46 (2008), 1-17

- before (1.8): remove the sentence “Note that we must have $\alpha_1 \alpha_2 = 0$, since $q$ is primitive.”
- p.8, line -7: for “Theorem 1 and Remark 1” read “Theorem 2”
- estimate in the second line of the proof of Lemma 2.3: for $n^{3/2}\Delta^{-1/2} + n^{1+\varepsilon}$ read $x^{3/2}\Delta^{-1/2} + x^{1+\varepsilon}$
- display after (2.5): for $s(n, \rho_j)$ read $|s(n, \rho_j)|$
- second display after (2.5): for $x$ read $h$
- (2.6): add $(nN)^\varepsilon$ at the end.
- Proposition 3.1: for $n \equiv 3 \pmod{8}$ read $n \equiv 3 \pmod{24}$
Hybrid bounds for twisted $L$-functions, Crelle 621 (2008), 53-79

- (4.9): $J_{k-1} = i^{k-1} \phi_{k-1,0}
- on p.75 it is assumed that $V$ is independent of $t$. This is a priori not the case. Instead of the approximate functional equation (2.12) one should use Proposition 1 of “A hybrid asymptotic formula for the second moment...” This introduces an error of $D_{1/2}^1 T^{-A}$ in (7.2) and the argument goes through as claimed. (7.3) holds only on the support of $\psi$ (which is all that is needed) and for the display after (7.4) one has to first write $V$ as an inverse Mellin transform.
- (8.8): for $N_0$ read $N$

On the central value of symmetric square $L$-functions, Math. Z. 260 (2008), 755-777

- equation (2.10) and the last display in Section 3: the $h$-sum should be removed
- equation (3.1): for $\chi_D(d)$ read $\chi_D(d)$

Twisted $L$-functions over number fields..., GAFA 20 (2010), 1-52

- p.7, line -2: add “...to a section $\phi \in H$ such that the restriction of $\phi(s)$ to $K$ is independent of $s \in C$.”
- p.11, lines -11 to -9: $q$ has to be restricted to a fixed parity $q \equiv \kappa \mod 2$ for $\kappa \in \{0,1\}$.
- the second last display on p.30 is not correct as claimed, but a variant of it is true. See http://www.renyi.hu/~gharcos/hilbert_erratum.pdf for a corrigendum
- Section 2.12: some notational changes are necessary: In lines -5 to -1 of p. 32, the ideal classes should be understood in the narrow sense, while the generator $\gamma$ and the product $r_1r_2$ should be totally positive. The Kuznetsov formula (92) should be corrected as follows: on the left hand side the restriction $\varepsilon_\pi = 1$ should be omitted, and on the right hand side the summation over $U/\sqrt{U^2}$ should be restricted to $U^+/U^2$. Accordingly the proof must be slightly modified. The analysis must be carried out on the larger space $FS = L^2(GL_2(K)Z(K_\infty)\backslash GL_2(\mathbb{A})/K(\mathbb{C})) = \bigoplus_{\omega \in \hat{C}(K)} L^2(GL_2(K)\backslash GL_2(\mathbb{A})/K(\mathbb{C})\omega,\omega)$.

Sup-norms of Eigenfunctions on Arithmetic Ellipsoids, IMRN 2011

- p.7, line -4 in Section 2.1: for “even finite number” read “even number”
- p.18, line 10: for $1, x$ read $1, x_\infty$. 

Sup-norms of Eigenfunctions on Arithmetic Ellipsoids, IMRN 2011

- p.7, line -4 in Section 2.1: for “even finite number” read “even number”
- p.18, line 10: for $1, x$ read $1, x_\infty$. 
Subconvexity for a double Dirichlet series, Compositio Math. 174 (2011), 355-374

• p.358, sentence after (9): $\psi_2(n) = -1$ if ... and $\psi_{-2}(n) = -1$.
• Equation (11): $\delta_0 = \begin{cases} d_0, & \psi = \psi_1, d \equiv 1 (4) \text{ or } \psi = \psi_{-1}, d \equiv 3 (4), \\ 4d_0, & \psi = \psi_2, \text{ or } \psi_{-2}. \end{cases}$
• Equation (18), although quoted from [IK], is nevertheless incorrect (counterexample: $z = -s + 1/10$), but the polynomial dependence plays no role in the application of (18) on p. 368
• Equation (31): remove $\psi'(d)$ in the numerator in the first line
• p.362, line -4: for “and (11) together with (8) - (29), we find” read ”and (11), together with (8), to (29), we find”
• p.365, first display: ${\cal C} = \sum_{|y|\leq \frac{1}{4}} \left| \frac{1}{4} + i |u| \right| (i.e. remove \text{C}(0,u))$
• p.365, display after (39): add a factor $\pi^{-2z}$ to the first term on the right side and remove this factor in (43)
• p.368, 4th display, second line: for $n^{1/2 \pm it-s}d_0^{1/2+iu-w}$ read $n^{1/2 \pm it+s}d_0^{1/2+iu+w}$
• p.372, display before (67): $D_{\psi,\psi'}(t,u,p;W) \ll (TU)^{1/6} + T^{1/6}U^{1/3} \ll (TUS)^{1/6 + \varepsilon}$


• Proposition 3: for $\tilde{F}$ read $\tilde{F}$

Subconvexity for twisted $L$-functions on $GL(3)$, Amer. J. Math. 134 (2012), 1385-1421

• statement of Lemma 9: it should be

$$\mathcal{D} := \{ z \in \mathbb{C} : \inf \{ |z - y| : y \in [a,b] \} < \rho \}$$
(replace $>$ with $<$)
• p.1397, 4th display: the second line should read

$$\left( e \left( \mp \frac{s}{4} \right) \left( e \left( \pm \frac{a_1}{2} \right) + e \left( \pm \frac{a_2}{2} \right) + e \left( \pm \frac{a_3}{2} \right) \right) + e \left( \pm \frac{3s}{4} \right) \right)$$
• p.1400, line 1: for “$e(2\sqrt{y}D)$ or $\phi(y) = e(\pm 3(xy)^{1/3})$” read “$2\sqrt{y}D$ or $\phi(y) = \pm 3(xy)^{1/3n}$.

Period integrals an Rankin-Selberg $L$-functions on $GL(n)$, GAFA 22 (2012), 608-622

• p.612, first display: in the first integral a factor $y^k$ is missing.
• (3.5) should read

$$\asymp \prod_{j,k=1}^{n-1} \left| \frac{\Gamma_R(s+n(v_j + \ldots + v_k))}{\Gamma_R(1+n(v_j + \ldots + v_k))} \right|$$
• display after (3.10): for $x^{1/y}y^{1/y}$ read $xy^{y/x}$
Non-vanishing of $L$-functions, the Ramanujan conjecture, and families of Hecke characters, Canad. J. Math. 65 (2013), 22-51

- Lemma 6.2: The constant $C$ depends also on $\phi$.

On the 4-norm of an automorphic form, J. EMS 15 (2013), 1825-1852

- (2.12): the last formula should be $q^{1/2}|\lambda_\nu(q)| \ll 1$ instead of $q^{-1/2}|\lambda_\nu(q)| \ll 1$
- (2.16) and (2.18): the integral in the diagonal should be from $-\infty$ to $\infty$.


- Section 2.5, line 2: for “space functions” read “space of functions”.
- second line, proof of Lemma 4.1: for $\alpha_1$ and $\alpha_2$ read $\alpha$, $\beta$.
- two lines before (4.11): for $N\ell^{1/2}$ read $nR_F(\ell)^{1/2}$
- (4.11): for $\delta_1$ read $\delta_2$

Applications of the Kuznetsov formula on $GL(3)$, Invent. math. 194 (2013), 673-729

- p.677, first display: for $(SL(3, \mathbb{Z}) \cup U) \setminus U$ read $(SL(3, \mathbb{Z}) \cap U) \setminus U$
- (1.4): the left hand side should be $C^{-1-\varepsilon}$
- display after (2.13): the leading constant should be 4 instead of 8
- line below (3.5): constant $\to$ constants
- Lemma 2: the left hand side should have exponent $-1-\varepsilon$ instead of $-1$. The proof needs to be modified as follows: let $T := (1+|\nu_0|) \times 1+|\nu_1|, |\nu_2|)$ and fix $\varepsilon > 0$.
  - in the third display of the proof we integrate $y_1, y_2$ over $[T^{-\varepsilon}, \infty)$.
  It is easy to see that for some absolute constant $c$ there are at most $T^{c\varepsilon}$ copies of the fundamental domain intersecting $[T^{-\varepsilon}, \infty)^2 \times [0,1]^3$.
  Hence the fourth display becomes $\ll T^{c\varepsilon/2}\|\phi\|$. By the exponential decay of the Whittaker function at $y_1, y_2 \geq T^{1+\varepsilon/3}$ we have
  \[
  \int_{T^{-\varepsilon}}^\infty \int_{T^{-\varepsilon}}^\infty |\tilde{W}_{\nu_1, \nu_2}(y_1, y_2)|^2 (y_1^2 y_2)^{1/2} \frac{dy_1 dy_2}{y_1 y_2} \geq \int_0^\infty \int_0^\infty \int_0^\infty \int_0^\infty |\tilde{W}_{\nu_1, \nu_2}(y_1, y_2)|^2 (y_1^2 y_2)^{1/4} \frac{dy_1 dy_2}{y_1 y_2} - T^{\frac{1}{2}(1+\varepsilon)}\varepsilon^{-\frac{1}{4}} \int_0^\infty |\tilde{W}_{\nu_1, \nu_2}(y_1, y_2)|^2 (y_1^2 y_2)^{1/4} \frac{dy_1 dy_2}{y_1 y_2} \gg (1+|\nu_0|)(1+|\nu_1|)(1+|\nu_2|)^{-1/2},
  \]
  and we complete the proof as before with an additional factor $T^{c\varepsilon}$.

- Lemma 3: the variables $m_1$ and $m_2$ should be exchanged, and in the factor $(n, m)^\varepsilon$ in (4.1) should be $(nm)^\varepsilon$.
- Section 7, line 4: for $m_1 x_2$ read $m_1 x_1$.
- in the display after (7.3), the indices $m_1$, $m_2$ should be interchanged in the $w_0$-Kloosterman term $S_3$, the same in (8.2). Corresponding, the Kloosterman sum in (9.3) should be $S(\varepsilon_1, \varepsilon_2 m, n, 1, D_1, D_2)$. For these sums, the analogue of (6.6) is
  \[
  \sum_{D_1 \leq X_1} \sum_{D_2 \leq X_2} |S(\pm 1, m, n, 1, D_1, D_2)| \ll (X_1 X_2)^{3/2+\varepsilon} (nm)^\varepsilon.
  \]
(8.7): for $X_{1}^{2}X_{2}$ read $(X_{1}X_{2})^{2}$. Correspondingly, in the estimation of $\Sigma_{2a}$ in the proof of Theorem 2 replace $X$ with $X^{2}$.

long display before (8.12): for $x_{2} + i\sqrt{x_{1}^{2} + 1}$ in the the last line read $\sqrt{x_{1}^{2} + 1}$

(9.2): for $-C_{1}, -C_{2}$ read $C_{1}, C_{2}$

Proof of Theorem 5, line 8: for “From Proposition 3 and Proposition 5” read “From Lemma 3 and Proposition 5”

Reference 25: for Li, Xinnan read Li, Xiannan

and mean-value estimates for automorphic representations”

Reference 14: the correct title is “A problem of Linnik for elliptic curves read “From Lemma 3 and Proposition 5”

Proof of Theorem 5, line 8: for “From Proposition 3 and Proposition 5”

(9.2): for $Y(8.13)$, second line: the last term should be $\gg (7.6)$ should read $\Lambda \gg C^{2}(\ell_{1}\ell_{2})^{-1-\varepsilon}$.

(8.13), second line: the last term should be $N^{1/2}/(dr_{2})^{1/2}$ instead of $NM^{1/2}/(dr_{2})$

p.497, line 2: the first formula should be replaced with

| $\lambda_{2} \left( \delta_{2} \over g \right) \lambda_{1} \left( \delta_{1} \over h \right) \left( \ell_{1}g \cdot \ell_{2}h, d' \right)^{1/2} | \leq \left( \delta_{2} \over g \right)^{1/2} \left( \delta_{1} \over h \right)^{1/2} (gh)^{1/2} = (\delta_{1}\delta_{2})^{1/2}$

(12.4): replace the right hand side with $q^{*}(AB)^{1/2}X$.

p. 512, penultimate display: this expression is only used for $B > AX^{2}$, in which case the condition $a_{1}a_{2} = b_{1}b_{2}$ is moot
The sup-norm problem for PGL(4), IMRN 2015 (vol. 14), 5311-5332

- (3.4): for $\times$ read $\ll$
- (3.9), (6.2), (6.4), (6.6): for $|c(\mu)|^{-2}$ read $\prod_{1 \leq j < k \leq n} (1 + |\mu_j - \mu_k|)$.


- penultimate paragraph of introduction: for $\mathbb{Q}(\sqrt{n^2 + 1})$ read $\mathbb{Q}(\sqrt{n^2 - 1})$

On the size of Ikeda lifts, manuscr. math. 148 (2015), 341-349

- equation (2.3): $\pi^k$ in the numerator should be $\pi^{k-1}$.

Subconvexity for sup-norms of cusp forms on PGL(n), Selecta Math. 22 (2016), 1269-1287

- two lines after (4.3): for “feature” read “features”

Applications of the Kuznetsov formula on GL(3): the level aspect, Math. Ann. to appear

- Lemma 4 should be replaced with the following variation:

**Lemma 4.** Let $W: (0, \infty)^6 \to \mathbb{C}$ be a fixed smooth compactly supported function. Let $A_1, A_2 > 0$ and define $A := \exp(\max(\log A_1, \log A_2))$. Let $P \geq 1$, and let $\alpha_1, \alpha_2, \beta_1, \beta_2, \gamma_1, \gamma_2 \in \mathbb{R}$ be such that $\min(|\alpha_1|, |\alpha_2|, |\beta_1|, |\beta_2|, |\gamma_1|, |\gamma_2|) \leq P$. Then the six-fold Fourier transform

$$\tilde{J} := \int_{\mathbb{R}^6} J_{\epsilon; f}(A_1^{1/2}u_1v_1, A_2^{1/2}u_2v_2)W(t_1, t_2, u_1, u_2, v_1, v_2)$$

$$\times e(-t_1\alpha_1 - t_2\alpha_2 - u_1\beta_1 - u_2\beta_2 - v_1\gamma_1 - v_2\gamma_2)dt_1 dt_2 du_1 du_2 dv_1 dv_2$$

is bounded by

$$O_C \left((PA)^{5}(P^2 \max \left(A_2^{-2/3}A_1^{-4/3}, A_1^{-2/3}A_2^{-4/3}\right) + P^{-C})\right)$$

for any constant $C > 0$. In addition, it is bounded by

$$A^\epsilon \max(|\alpha_1|, |\beta_1|, |\gamma_1|)^{-1/2} \max(|\alpha_2|, |\beta_2|, |\gamma_2|)^{-1/2},$$

as long as both maxima are non-zero.

**Proof.** Suppose that $|\alpha_1|$ is the smallest of the variables. Choose a sufficiently large constant $c_2$ and a sufficiently large constant $c_1 > c_2$. We split the $x_1, x_2, x_3$-integration in four pieces

(i) $|x_1|, A_1^2|\eta_1|/\xi_1 \leq c_1P$, (ii) $|x_1| \leq c_2P, A_1^2|\eta_1|/\xi_1 \geq c_1P$, (iii) $|x_1| \geq c_1P, A_1^2|\eta_1|/\xi_1 \leq c_2P$

and the remaining portion (iv), which is contained in $|x_1|, A_1^2|\eta_1|/\xi_1 \geq c_2P$. The conditions (i) imply $|x_1| \ll P$, $x_2x_4 \ll PA_2^{2/3}A_1^{1/3}$ (note that this is $\gg P$ by Lemma 3), and the area of this region is $\ll P^2(A_2^{2/3}A_1^{1/3})(AP)^\epsilon$. Integrating by parts in the $y_1$-integral we can save arbitrarily many factors of $P$ in regions (ii) and (iii). Integrating by parts in $t_1$, the same holds for region (iv). We conclude the bound $O_C((PA)^{5}(P^2A_2^{-2/3}A_1^{-4/3}) + P^{-C})$. If, say, $|\alpha_2|$ is the smallest of the variables, we interchange indices and run the same argument.
The second bound follows by not restricting $x_1, x_2, x_3$ at all and applying in the penultimate display of the proof the simple stationary phase bound
\[
\int e(at + b\sqrt{t})W(t)dt \ll |a|^{-1/2}, \quad a \neq 0
\]
for a fixed smooth function $W$ with compact support in $(0, \infty)$.

- third display after (5.3): the right hand side should be \( \left( \frac{M^3 d_2}{N(d_1 d_2 d_3)^2 D} \right)^i \)
- penultimate display of Section 5: we apply the second bound of Lemma 4, unless \( x_1 x_2 y_1 y_2 z_1 z_2 = 0 \), in which case we apply the first bound with \( P = N^\varepsilon \). This replaces the last fraction in the first line
\[
\frac{(d_1 d_2 d_3)^2 N(D_1 D_2)^{1/2}}{M^3 d_2} \rightarrow \frac{\min(d_1 d_2, d_1 d_3, d_2 d_3) (D_1 D_2)^{1/2}}{M} + \frac{(d_1 d_2 d_3)^2 N(D_1 + D_2)}{M^3 d_2}
\]
which still suffices to conclude \( \Sigma_6 \ll N^{2+\varepsilon} \).

**DER SATZ VON GREEN-TAO, MITTEILUNGEN DMV 15 (2007), 160-164**

- p.162, line 40/41: for “unendlich” read “beliebig”

**L-FUNCTIONS, AUTOMORPHIC FORMS AND ARITHMETIC, IN: SYMMETRIES IN ALGEBRA AND NUMBER THEORY, GÖTTINGEN 2009**

- p.16, example 2: for “for all primes \( p \)” read “for almost all primes \( p \)”