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Abstracts of Short Communications and Posters

Section:

3. Number Theory and Arithmetic Algebraic Geometry

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Estimates for Kloosterman sums for totally real number fields

For any number field F, there are Kloosterman sums

$$S(r,r';c) = \sum_{d \bmod (c)} e^{2\pi i \mathrm{Tr}_{F/\mathbf{Q}}((rd+r'a)/c)},$$

where $c \neq 0$, $c \in \mathcal{O}_F$, and $r, r' \in F - \{0\}$ satisfy $\mathrm{T}\, r_{F/\mathbf{Q}}(ry) \in \mathbf{Z}$, for all $y \in \mathcal{O}_F$. These sums satisfy a bound of Weil-Salié type (see Bruggeman-Miatello, Duke M. J., 1995). If F is totally real of degree d, denote the different embeddings $\sigma_1, \ldots, \sigma_d : F \to \mathbf{R}$. We prove, for any $d \geq 2$, $\varepsilon > 0$:

$$\sum_{c \in \mathcal{O}_F,\, 0 < |c^{\sigma_j}| \leq X} N_{F/\mathbf{Q}}(c)^{-1} S(r,r';c) \ll X^{(d-1)/2+\varepsilon} \quad \text{as } X \to \infty, \qquad (1)$$

in the absence of eigenvalues with exceptional coordinates. We also give the influence of the parameters r and r'. Our proof uses a sum formula of Kuznetsov type that includes the contribution of non-trivial K-types.