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Section:

3. Number Theory and Arithmetic Algebraic Geometry

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Winterhof, Arne, TU Braunschweig

On Incomplete Character Sums

Using a special ordering $\{x_0, \ldots, x_{q-1}\}$ of the elements of an arbitrary finite field $\mathbf{F}_q$ the classical Polya-Vinogradov bound is generalized to $\left|\sum_{\nu=0}^{k-1} \chi(a + x_\nu)\right| < q^{1/2}(1 + \log q);\ a \in \mathbf{F}_q$, where χ denotes a non-trivial multiplicative character. Furthermore, it is investigated how far the improvements of D. A. Burgess for prime fields $\mathbf{F}_p$ can be extended to arbitrary finite fields.

References: 1. A. Winterhof, On the distribution of powers in finite fields, *Finite Fields and Appl.* , to appear. 2. A. Winterhof, "On incomplete character sums", Bericht 98/01, Institute für Mathematik, TU Braunschweig.