THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Number Theory Seminar

On the distribution of Jacobi sums

(Joint work with Weizhe Zheng and Zhiyong Zheng)

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Abstract

Let $\mathbf{F}_q$ be a finite field of q elements. For multiplicative characters $\chi_1, \ldots, \chi_m$ of $\mathbf{F}_q^\times$, we let $J(\chi_1, \ldots, \chi_m)$ denote the Jacobi sum. Nicholas Katz and Zhiyong Zheng showed that for $m = 2$, the normalized Jacobi sum $q^{-1/2}J(\chi_1, \chi_2)$ ($\chi_1\chi_2$ nontrivial) is asymptotically equidistributed on the unit circle as $q \to \infty$, when χ_1 and χ_2 run through all nontrivial multiplicative characters of $\mathbf{F}_q^\times$. In this paper, we show a similar property for $m \geq 2$. More generally, we show that the normalized Jacobi sum $q^{-(m-1)/2}J(\chi_1, \ldots, \chi_m)$ ($\chi_1 \cdots \chi_m$ nontrivial) is asymptotically equidistributed on the unit circle, when $\chi_1, \ldots, \chi_m$ run through arbitrary sets of nontrivial multiplicative characters of $\mathbf{F}_q^\times$ with two of the sets being sufficiently large. The case $m = 2$ answers a question of Shparlinski.

Date:	November 24, 2017 (Friday)
Time:	3:00 – 4:00pm
Venue:	Room 210, Run Run Shaw Bldg., HKU

All are welcome