1047-11-257   **Alex Iosevich**, **Igor Shparlinski** and **Maosheng Xiong*** (`xiong@math.psu.edu`), Dept. Math, Pennsylvania State University, State College, PA 16802. *Sets with Integral Distance in Finite Fields.*

This is recent joint work with Shparlinski and Iosevich. Given a positive integer n, a finite field F_q of q elements (q odd), and a non-degenerate quadratic form Q on F_q^n, we study the largest possible cardinality of subsets $E \subseteq F_q^n$ with pairwise integral Q-distance, that is, for any two vectors $x = (x_1, \ldots, x_n), y = (y_1, \ldots, y_n)$ of E, one has

$$Q(x - y) = u^2$$

for some $u \in F_q$. (Received January 29, 2009)