1038-05-48 **Nets Katz** and **Chun-Yen Shen*** (shenc@indiana.edu), 800 N.Union St, Apt 523, Bloomington, IN. *On the Sum Product estimates and 2-variables expanders.*

The sum product phenomenon has received a great deal of attention, since Erdös and Szemerèdi made their well known conjecture that

$$\max(|A+A|, |AA|) \geq C_\epsilon |A|^{2-\epsilon} \forall \epsilon > 0.$$

where A is a finite subset of integers and

$$A + A = \{a + b : a \in A, b \in A\},$$

and

$$AA = \{ab : a \in A, b \in A\}.$$

In this talk, we will present that if A is a subset in a finite field F_p, p prime, with $|A| < p^{\frac{1}{2}}$ then

$$\max(|A+A|, |F(A,A)|) \gtrapprox |A|^{\frac{13}{12}}.$$

where F : $F_p \times F_p$ to F_p , $(x, y) \to x(f(x) + by)$, f is any function and $b \in F_p^*$. For the case f=0 and $b = 1$, it corresponds to the well known sum product theorem by Bourgain, Katz and Tao. (Received January 23, 2008)