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**Zbl 404.10029**
**Erdős, Paul; Sárközy, András**
*On differences and sums of integers. I.* (In English)
**J. Number Theory 10, 430-450 (1978). [0022-314X]**

A set $B=\{b_1,b_2,\dots,b_i\}\subset\{1,2,\dots,N\}$ is a difference intersector set if for any set $A=\{a_1,a_2,\dots,a_j\}\subset\{1,2,\dots,N\}$, $j=\varepsilon N$ the equation $a_x-a_y=b$ has a solution. The notion of a sum intersector set is defined similary. Using exponential sum techniques, the authors prove two theorems which in essence imply that a set which is well- distributed within and amongst all residue classes of small modules is both a difference and a sum intersector set. The regularity of the distribution of the non-zero quadratic residues (mod $p$) allows the theorems to be used to investigate the solubility of the equations $\left(\frac{a_x-a_y}{p}\right)=+1$, $\left(\frac{a_r-a_s}{p}\right)=-1$, $\left(\frac{a_t-a_u}{p}\right)=+1$, and $\left(\frac{a_v-a_w}{p}\right)=-1$. The theorems are also used to establish that "almost all" sequences form both difference and sum intersector sets.

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Classification:
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11B13 Additive bases
11P99 Additive number theory
11D85 Representation problems of integers
11L03 Trigonometric and exponential sums, general

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