1090-05-231 **Oktay Olmez*** (oolmez@iastate.edu), Iowa State University, Ames, IA 50011. *$1\frac{1}{2}$-designs and $1\frac{1}{2}$-difference sets.*

Let $T = (\mathcal{P}, \mathcal{B}, \mathcal{I})$ be a tactical configuration with parameters (v, b, k, r). For every point $x \in \mathcal{P}$ and every block $B \in \mathcal{B}$, let $\phi(x, B)$ be the number of flags $(y, C) \in \mathcal{I}$ such that $y \in B \setminus \{x\}$, $x \in C$ and $C \neq B$. A $1\frac{1}{2}$-design with parameters $(v, b, k, r; \alpha, \beta)$ is a tactical configuration T such that

$$\phi(x, B) = \begin{cases} \alpha, & x \notin B; \\ \beta, & x \in B. \end{cases}$$

Examples of $1\frac{1}{2}$-designs include 2-designs, transversal designs, and partial geometries. Let G be a (multiplicative) group and S be a non empty subset of G. For any $g \in G$, we define the *translate* of S by $gS = \{gs : s \in S\}$, and define the *development* of S by $\mathrm{Dev}(S) = \{gS : g \in G\}$. S is called a $1\frac{1}{2}$-difference set, if $(G, \mathrm{Dev}(S))$ is a $1\frac{1}{2}$-design. In this talk, we investigate the properties of $1\frac{1}{2}$-difference sets via the group ring $\mathbb{Z}G$ and group characters. (Received March 02, 2013)