Meeting: 1005, Newark, Delaware, SS 5A, Special Session on Designs, Codes, and Geometries

1005-05-187 **J. F. Dillon*** (`jfdillon@afterlife.ncsc.mil`), National Security Agency, Fort George G. Meade, MD 20755. *More Difference Sets in* GF(2^m). Preliminary report.

Dillon and Dobbertin proved that, if $L := \mathrm{GF}(2^m)$, $\Delta_k(x) := (x+1)^d + x^d + 1$, $d := 4^k - 2^k + 1$ and $\gcd(k,m) = 1$, then $B_k := L \backslash \Delta_k(L)$ is a difference set in the cyclic multiplicative group $L^\times$ of L; used in the proof were the auxiliary functions $c_k^\gamma(x) := b_k(\gamma x^{2^k+1})$, where γ is in $L^\times$ and b_k is the characteristic function of B_k on L. When m is odd c_k^γ is itself the characteristic function of a cyclic difference set which is equivalent to B_k.

In this talk we show that, when m is even and γ is not a cube in L, then c_k^γ is the characteristic function of a difference set in the elementary abelian *additive* group of L; and we point out some analogous results for fields of odd characteristic p. (Received February 08, 2005)