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

1005-94-109 **Gary McGuire**, Department of Mathematics, National University of Ireland, Maynooth, Ireland, and **Harold N Ward*** (`hnw@virginia.edu`), Department of Mathematics, University of Virginia, Charlottesville, VA 22904. *Designs in codes.* Preliminary report.

In his famous paper on four fundamental parameters [*Inform. and Control* **23** (1973) 407–438], Philippe Delsarte proved this theorem: let C be a code over $\mathrm{GF}(q)$, not necessarily linear but containing 0, and let d' be the dual distance of C. For t with $1 \leq t \leq d'$, suppose that the number of different weights of words of C that are at least t is at most $d' - t$. Then for any $w \geq t$, each word x of weight t in the ambient space of C agrees on the support of x with a number of words of weight w in C that is independent of x.

When C is linear, one can show that the conclusion also holds for the dual of C. We give some applications of this result. We also discuss the general problem of realizing a given design in some linear code from the words whose weight is the block size, as in the Assmus-Mattson theorem. (Received February 02, 2005)