

GENERALIZED HAMMING WEIGHTS FOR LINEAR CODES

Iskra Núñez, University of Texas at El Paso; Estefan Ortiz, St. Mary's University; Alicia Urdapilleta, Mills College

Error control codes are widely used to increase the reliability of transmission of information over various forms of communications channels. The *Hamming weight* of a codeword is the number of nonzero entries in the word; the weights of the words in a linear code determine the error-correcting capacity of the code. The r^{th} generalized Hamming weight for a linear code C , denoted by $d_r(C)$, is the minimum of the support sizes for r -dimensional subcodes of C . For instance, $d_1(C)$ equals the traditional minimum Hamming weight of C . In 1991, Feng, Tzeng, and Wei proved that the second generalized Hamming weight $d_2(C) = 8$ for all double-error correcting $BCH(2^m, 5)$ codes. We study $d_3(C)$ and higher Hamming weights for $BCH(2^m, 5)$ codes by a close examination of the words of weight 5.