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**W. Cary Huffman\*** ([whuffma@luc.edu](mailto:whuffma@luc.edu)), Department of Mathematics and Statistics, Loyola University Chicago, 1032 W. Sheridan Rd., Chicago, IL 60660. *Cyclic  $\mathbb{F}_q$ -Linear  $\mathbb{F}_{q^t}$ -Codes.*

Additive codes over  $\mathbb{F}_4$  are intimately related to quantum codes. We consider a natural generalization of additive codes to  $\mathbb{F}_q$ -linear  $\mathbb{F}_{q^t}$ -codes. We develop the theory of these codes when they are cyclic and count them. Then we place two different trace inner products on these codes and decide precisely when the cyclic ones are self-orthogonal under these two inner products. We also present counts for the number of self-orthogonal and self-dual cyclic codes under each of these inner products. (Received January 21, 2010)