1079-94-173 **Jon-Lark Kim**, Department of Mathematics, University of Louisville, Louisville, KY 40292, and **Xiaoyu Liu*** (xiaoyu.liu@wright.edu), Department of Mathematics and statistics, Wright State University, Dayton, OH 45435. *A Generalized Gleason-Pierce-Ward Theorem.*

The Gleason-Pierce-Ward theorem gives constraints on the divisor and field size of a linear divisible code over a finite field whose dimension is half of the code length. This result is a departure point for the study of self-dual codes. In recent years, additive codes have been studied intensively because of their use in additive quantum codes. In this work, we generalize the Gleason-Pierce-Ward theorem on linear codes over $GF(q)$, $q = p^m$, to additive codes over $GF(q)$. The first step of our proof is an application of a generalized upper bound on the dimension of a divisible code determined by its weight spectrum. The bound is proved by Ward for linear codes over $GF(q)$, and is generalized by Liu to any code as long as the MacWilliams identities are satisfied. The trace map and an analogous homomorphism $x \mapsto x - x^p$ on $GF(q)$ are used to complete our proof. (Received January 11, 2012)