1043-94-10 **Xiaoyu Liu*** (xliu@noether.math.wright.edu), Department of Mathematics and Statistics, Wright State University, 3640 Colonel Glenn Highway, Dayton, OH 45435, and **Jon-Lark Kim** (jl.kim@louisville.edu), Department of Mathematics, University of Louisville, Louisville, KY 40292. *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. The result is used to study formally self-dual codes. In recent years, additive codes have been studied intensively because of their use to additive quantum codes. In this work, we generalize the Gleason-Pierce-Ward theorem on linear codes over GF(q) to additive codes over GF(q). The first step of our proof is an application of a generalized Ward's bound on dimension of a divisible code given by its weight spectrum. The bound is proved by Harold N. Ward on 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 $x - x^p$ on GF(q) are used to complete our proof. As might be expected, the Gleason-Pierce-Ward theorem could be further generalized to linear codes over certain rings. (Received June 11, 2008)