1011-05-253   **Daniel J. Katz*** (`dankatz@math.princeton.edu`), Princeton University, Department of Mathematics, Fine Hall – Washington Road, Princeton, NJ 08544. *McEliece Theorems for Cyclic Codes over Galois Rings.*

We present some new theorems on the p-divisibility of weights in cyclic (and abelian) codes over the Galois rings (a class of rings which includes finite fields and integer residue rings modulo prime powers). These theorems are analogues of McEliece's theorem for cyclic codes over prime fields. We obtain p-adic approximations of weights by means of carefully constructed polynomials and combinatorial analysis. We generalize and, in some cases, sharpen, some of the excellent results already obtained in this area by Delsarte-McEliece, Helleseth-Kumar-Moreno-Shanbhag, and Calderbank-Li-Poonen. (Received August 29, 2005)