1079-13-302   **Sergio Lopez-Permouth**, **Hakan Ozadam**, **Ferruh Ozbudak** and **Steve Szabo***
(`steve.szabo@eku.edu`). *Polycyclic Codes over Galois Rings with Applications to Repeated-Root Constacyclic Codes.*

Cyclic, negacyclic and constacyclic codes are part of a larger class of codes called polycyclic codes. These are codes which can be viewed as ideals of a factor ring of a polynomial ring. The ambient ring of polycyclic codes over $GR(p^a, m)$ is studied here. Along with some structure details of the ambient ring, the existance of a certain type of generating set for an ideal is proven. It is shown that these generating sets are strong Groebner bases. A method for finding such sets in the case that $a = 2$ is also given. The Hamming distance of certain constacyclic codes of length np^s and $2np^s$ over F_{p^m} is computed. A method, which determines the Hamming distance of the constacyclic codes of length np^s and $2np^s$ over $GR(p^a, m)$, is described. In particular, the Hamming distance of all cyclic codes of length p^s over $GR(p^2, m)$ and all negacyclic codes of length $2p^s$ over F_{pm} is determined explicitly. (Received January 17, 2012)