Meeting: 1001, Evanston, Illinois, SS 5A, Special Session on Codes and Applications

1001-94-335 **Mona Musa*** (mmusa@siue.edu), Department of Mathematics and Statistics, College of Arts and Sciences, Southern Illinois University Edwardsville, Edwardsville, IL 62026. *On the double circulant presentation of the binary extended quadratic residue code.* Preliminary report.

Let p be a prime such that $p \equiv -1 \bmod 8$. Let $k = (p+1)/2$ and write $k = 2^m q$, q odd. Let $S = F_2[x]/\langle 1 + x^k \rangle$ where F_2 is the Galois field of two elements. We prove that the binary extended quadratic residue codes of length $2k$ have a double circulant presentation in the following three cases: (1) $q = 1$. (2) q is a prime and 2 is a primitive root modulo q. (3) Let X be the class of x in S, and σ the algebra of automorphisms on S that sends X^i to X^{-i}. Factor $1 + x^q$ over F_2 into irreducible factors. If the class of those factors in S is fixed by σ up to a unit, then the codes have a double circulant presentation. (Received August 30, 2004)