1077-VJ-924 **Keegan C. Gary*** (kgary2@students.kennesaw.edu), **Mari Castle** (mfc7379@kennesaw.edu) and **Joe DeMaio** (jdemaio@kennesaw.edu). *Total Efficient Domination in Cayley Graphs.* Preliminary report.

A set $S \subseteq V$ is a **dominating set** of $G = (V, E)$ if each vertex in V is either in S or is adjacent to a vertex in S. A set $S \subseteq V$ is a **total efficient dominating set** (or **TEDS**) of a graph $G = (V, E)$ if each vertex in V is adjacent to exactly one vertex in S. While the problem of domination is one of optimization, the question surrounding a TEDS is that of existence. In 2002, Gavlas and Schultz showed that a TEDS S exists for the path graph P_n if and only if $n \not\equiv 1 \bmod 4$, and that a TEDS S exists for the cycle graph, C_n, if and only if $n \equiv 0 \bmod 4$. The cycle graphs are a special class of circulant graphs, which in turn, are a special class of Cayley graphs. The **Cayley graph** $C(A, X)$ for a group A with generating set X has the elements of A as vertices and has an edge directed from a to ax for every $a \in A$ and $x \in X$. In this talk we will classify all circulant graphs that admit a TEDS, and begin to investigate the existence of a TEDS in Cayley graphs. (Received September 14, 2011)