1145-05-685 **Rebecca Lynn Jackson*** (`rljackson@csustudent.net`), 423 Lazy Hill Rd, Moncks Corner, SC 29461. *Introducing 3-path Domination.* Preliminary report.

A dominating set of a graph G is a set of vertices S such that for every $v \in V(G)$ either $v \in S$ or v is adjacent to a $v_1 \in S$. The domination number, $\gamma(G)$, is the minimum number of vertices needed to create a dominating set. Haynes and Slater introduced paired-domination in 1998. A paired-dominating set is a dominating set whose induced subgraph contains a perfect matching. The paired-domination number, $\gamma_p(G)$, is the minimum number of vertices needed to create a paired-dominating set. Building on paired-domination, we introduce 3-path domination. We define a 3-path dominating set of G to be $S = \{P_1, P_2, \ldots, P_k | P_i \text{ is a 3-path}\}$ such that the vertex set $V(S) = V(P_1) \cup V(P_2) \cup \cdots \cup V(P_k)$ is a dominating set and the 3-path domination number, $\gamma_{P_3}(G)$, to be the minimum number of 3-paths needed to dominate G. We have shown that the 3-path domination problem is NP-complete, so it is of interest to find bounds on $\gamma_{P_3}(G)$ and closed formulas for particular families of graphs such as Harary graphs, Hamiltonian graphs, and subclasses of trees. We will share these results along with generalizations of 3-path domination. Part of this material is based upon work supported by the NSF under grant no. DMS 1757616. (Received September 12, 2018)