

1023-05-968

**S. Jeremy Lyle\*** (slyle@clemons.edu) and **Renu Laskar** (rclsk@clemons.edu). *Fall Coloring of Cartesian Products of Graphs*. Preliminary report.

The question of whether a graph can be partitioned into  $k$  independent dominating sets is considered. For  $k = 3$ , it is shown that a graph  $G$  can be partitioned into three independent dominating sets if and only if the cartesian product  $G \square K_2$  can be partitioned into three independent dominating sets. The graph  $K_2$  can be replaced by any graph  $H$  such that  $f : Q_n \rightarrow H$ , where  $f$  is a *type-II* graph homomorphism.

The cartesian product of two trees is considered, as well as the complexity of partitioning a bipartite graph into three independent dominating sets, which is shown to be NP-complete. For other values of  $k$ , repeated cartesian products are considered, leading to a result that shows for what values of  $k$  the hypercubes can be partitioned into  $k$  independent dominating sets. (Received September 23, 2006)