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Hemanshu Kaul*, Kaul@iit.edu, and **Christodoulos Mitillos**. *Fall Coloring of Graphs*. Preliminary report.

Fall Coloring of graph asks for a partition of its vertex set into independent sets that are also dominating sets. Unlike typical graph theoretic invariants, the fundamental question is that of existence of such a coloring. Note that any such coloring requires at least chromatic number of colors. We will construct graphs with arbitrary large difference between their chromatic number and the minimum number of colors in any of their fall colorings, answering a question of Dunbar et al. (2000). We will also give construction of graphs that can be fall colored with many different pre-specified number of colors. We will describe the fall colorings for some basic graph classes, graph products, and give a sharp sufficient condition on the minimum degree of a graph that guarantees its fall coloring. (Received July 27, 2014)