1067-05-2103 **Sarah Spence Adams** (Sarah.Adams@olin.edu), Olin Hall, Needham, MA 02492, **Zachary Brass** (Zachary.Brass@students.olin.edu), Olin Hall, Needham, MA 02492, **Connor Stokes*** (Connor.Stokes@students.olin.edu), Olin Hall, Needham, MA 02492, **Denise Sakai Troxell** (troxell@babson.edu), Babson Hall, Babson Park, MA 02457, and **Steven Luke Zinnen** (steven.zinnen@students.olin.edu), Olin Hall, Needham, MA 02492. *Dynamic Monopolies and k-Conversion Sets in Graph Products and Triangular Grids: Modeling the Spread of Fault in Distributed Network Systems.*

In a graph theoretical model of faults in distributed computing and communication networks, each element in the network is represented by a vertex of a graph where edges connect pairs of communicating elements, and each colored vertex corresponds to a faulty element at discrete time periods. We will focus on two processes that have been used to model the spread of fault to a certain vertex by checking for faults within its neighbors. These processes have also been used to model the spread of disease and opinion through social networks. In a majority (resp., k-conversion) process, a vertex becomes permanently colored in a certain time period if the majority (resp., at least k) of its neighbors were in the colored state in the previous time period. A dynamic monopoly (resp., k-conversion set) is a set of vertices which, if initially colored, will result in all vertices eventually being colored in a majority (resp., k-conversion) process. We answer several open problems by presenting bounds and some exact values for the minimum number of vertices in dynamic monopolies and/or k-conversion sets for several types of graphs, including Cartesian and tensor products, as well as planar, cylindrical and toroidal triangular grid graphs. (Received September 22, 2010)