Emily Berger* (erb90@mit.edu). Minimal Percolating Sets in the Hypercube and Related Graphs.

We study the extremal problem of finding the minimal size of a percolating set in the hypercube, the square of the hypercube, and the augmented hypercube. Consider the following process of bootstrap percolation on a graph $G$. Let $S \subseteq V(G)$ denote a set of initially infected vertices. Throughout this process, some $v \in V(G)$ becomes infected only if it has $r$ previously infected neighbors. We say $S$ is an $r$-percolating set if all of $V(G)$ becomes infected by this process. We study, for fixed $r \geq 3$, how the size of a minimal $r$-percolating set varies with the dimension of $G$; this process is well understood for $r < 3$. We provide asymptotic bounds and exact values in some cases. (Received September 22, 2010)