1120-05-308 **Charles Tomlinson*** (ctomlinson2@math.unl.edu) and **Philip DeOrsey**. *Fast percolation on the hexagonal lattice.* Preliminary report.

In r neighbor bootstrap percolation one considers the evolution of a cellular automaton consisting of cells where new cells become infected if at least r of their neighbors are already infected. Classical interest was in the model where cells were selected for inclusion in the initially infected set, seed, independently at random with probability p. The effects of p on expected percolation time and the probability of percolation have been studied extensively.

We approach the model from an extremal perspective, asking how fast a convex region in a hexagonal lattice can be percolated by a minimum size seed 3-neighbor percolation. The fastest time is known for squares in a square lattice with 2 neighbor percolation. In a regular hexagon whose sides contain n sites, the n-hex, we show that the fastest percolation can occur is in $2n+1$ steps. Unlike the extremal examples for the square grid, the seed does not reside in n-hex. When the seed is entirely contained in the n-hex we show that the fastest percolation time, t satisfies $2n+1 \leq t \leq \frac{7}{3}(n-2)+3$. The upper bound comes via construction which we conjecture, and are working to show, is optimal. (Received February 23, 2016)