1165-37-17 **Steven J Miller*** (sjm1@williams.edu), 33 Stetson Court, Williamstown, MA 01267. *Analyzing Virus Dynamics on k-level Starlike Graphs.* Preliminary report.

Previous work determined the long term evolution of virus propagation on a hub-and-spoke graph of one central node and n neighbors, with edges only from the neighbors to the hub (a 2-level starlike graph), under a Suspectible Infected Suspectible model governed by the interactions between the infection and cure probabilities, along with the number of nodes. For any n, there is a critical threshold relating these rates, below which the virus dies out, and above which the probabilistic dynamical system converges to a non-trivial steady state. For a, the probability at any time step that an infected node is not cured, and b, the probability at any time step that an infected node infects its neighbors, the threshold for the virus to die out is $b \leq (1-a)/\sqrt{n}$. We extend to 3-level starlike graphs (connecting n_2 spoke nodes to the n_1 spoke nodes connected to the central hub). This yields a critical convergence threshold of $b \leq (1-a)/\sqrt{n_1+n_2}$. Our analysis generalizes to k-level starlike graphs (each $k-1$-level node has exactly n_k neighbors, and the only edges added are from the k-level nodes) for infection rates below the critical threshold of $(1-a)/\sqrt{n_1+n_2+\cdots+n_{k-1}}$. Joint with Jack Murphy and Akihiro Takigawa. (Received January 01, 2021)