1035-39-234 **Ronald E Mickens*** (`rohrs@math.gatech.edu`), Clark Atlanta University, Box 1744 - Physics Department, Atlanta, GA 30314. *SIR Models with Square-Root Dynamics.*

We study various forms of SIR models where the disease dynamics is modeled by either a $\sqrt{(SI)}$ or $\sqrt{I}S$ term, in ontrast to the standard SI representation. We further examine cases where the infective individuals are removed at rates proportional to either I or $\sqrt{I}$. Introducing nullclines, we construct the path of trajectories in the 2-dim S-I phase space and determine their general behavior. Nonstandard finite difference schemes are used to calculate numerical solutions to the differential equations. A major reason for examining SIR square-root models is the possibility of having populations go to extinction in a finite time. This work extends previous results of McNeil (1972) and Liu et al. (1986, 1987).

References

1. Donald R. McNeil, Biometric, Vol. 59 (1972), 494–447.

2. Wei-min Liu, et al., Journal of Mathematical Biology, Vol. 23 (1986), 187–204; Vol. 25 (1987), 359–380. (Received August 22, 2007)