1077-35-2848 **Jing Li*** (li_j@math.psu.edu), Department of Mathematics, Pennsylvania State University, 109 McAllister Building, State College, PA 16802, and **Xingfu Zou**. *Modeling spatial spread of infectious diseases with a fixed latent period in a spatially continuous domain.*

In this talk, with the assumptions that an infectious disease in a population has a fixed latent period and the latent individuals of the population may diffuse, we formulate an SIR model with a simple demographical structure for the population living in a spatially continuous environment. The model is given by a system of reaction-diffusion equations with a discrete delay accounting for the latency and a spatially non-local term caused by the mobility of the individuals during the latent period. We address the existence, uniqueness, and positivity of solution to the initial-value problem for this type of system. Moreover, we investigate the traveling wave fronts of the system and obtain a critical value c^* which is a lower bound for the wave speed of the traveling wave fronts. Although we can not prove that this value is exactly the minimal wave speed, numerical simulations seem to suggest that it is. Furthermore, the simulations on the PDE model also suggest that the spread speed of the disease indeed coincides with c^*. We also discuss how the model parameters affect c^*. (Received September 22, 2011)