1145-60-1590 **Gregory Handy*** (handy@math.utah.edu), **Sean D Lawley** and **Alla Borisyuk**. *Influence of Receptor Recharge on the Statistics of Captured Particles.*

We consider a setup where particles are released into a domain and diffuse freely. Part of the boundary is absorbing, where the particles can escape the domain, another part is reflecting. The rest of boundary consists of capture regions that switch between being reflecting and absorbing. After capturing a particle, the capture region becomes reflecting for an exponentially distributed amount of time. This non-zero recharge time correlates the particles' paths, complicating the mathematical analysis of this system. We are interested in the distribution of the number of particles that are captured before they escape. Our results are derived from considering our system in several ways: as a full spatial diffusion process with recharging traps on the boundary; as a continuous-time Markov process approximating the original system; and lastly as a system of ODEs in a mean-field approximation. We discuss the conditions required for the approximations to yield similar results as the spatial process. We then apply them to investigate time courses for the expected number and higher ordered statistics of captured particles. We find that the number of expected cumulative captures increases linearly before saturating, and find an analytical expression for the duration of the linear growth. (Received September 23, 2018)