1098-60-141 **Ira B. Schwartz*** (ira.schwartz@nrl.navy.mil), US Naval Research Laboratory, Code 6792, 4555 Overlook Ave, SE, Washington, DC 20375, and **Lora Billings** (billingsl@mail.montclair.edu), **Luis Mier-y-Teran-Romero** (lmier-y@jhsph.edu) and **Brandon Lindley** (brandon.lindley.ctr@nrl.navy.mil). *Intervention-Based Stochastic Disease Eradication-A Stochastic control approach.*

Disease control is of paramount importance in public health, with infectious disease extinction as the ultimate goal. Although diseases may go extinct due to random loss of effective contacts where the infection is transmitted to susceptible individuals, the time to extinction in the absence of control may be prohibitively long. Intervention controls are typically defined on a deterministic schedule. In reality, however, such policies are administered as a Poisson process. We consider the effect of randomly distributed intervention as disease control on large finite populations in the presence of limited resources. Using a variational approach to locate the most likely path to extinction as a rare event, we characterize the optimal noise for extinction. Then we show how control, based on mean period and treatment fraction, modulates the average extinction times as a function of population size and infection spread rate. The results show an exponential improvement in extinction times even though the controls are implemented using a Poisson distribution. In addition, we show the optimal extinction path may be identified using finite time Lyapunov exponents. (Received January 21, 2014)