Simulations and Modeling of Mosquito Dispersal in Southern Africa to prevent Chikungunya

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Keywords: Dispersal, Sterile Insect Technique, Mosquito, Aedes Species, Parabolic PDE, Smart Symmetries.

Chikungunya is an infection in humans caused by the chikungunya virus. The virus is spread to humans by a bite of an infected female Aedes species mosquito. Chikungunya virus (CHIKV; Togaviridae, genus Alphavirus), transmitted to humans by the bite of Aedes spp. mosquito, leads to an acute fever associated with an arthromyalgic syndrome[1].To prevent this disease in Southern Africa, tools to control Aedes albopictus were developed. The Sterile Insect Technique (SIT) is a tool used based on the biological knowledge of insects. The C6/36 cell line was used for virus isolation [2]. In this paper we model the mosquito with a system combined with the parabolic PDEs. It will be shown that the environment influences the dispersal of mosquitos. It will be done using basic Lie or Smart symmetries in Lie Group.

References

[1] Schwartz O, Albert ML. Biology and pathogenesis of chikungunya virus, Nat Rev Microbio 1 2010;8:491500.

[2] Igarashi A, Isolation of a Singhs Aedes albopictus cell clone sensitive to dengue and chikungunya viruses, J Gen Virol, 1978.