Feedback Control Principles for Biological Control of Dengue Vectors

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Controlling diseases such as dengue fever, chikungunya or zika by spreading the parasitic bacterium *Wolbachia* in mosquito populations which are their vectors, is considered a promising tool to reduce their spread. While description of the conditions of such experiments has received ample attention from biologists, entomologists and applied mathematicians, the effective scheduling of the releases remains an interesting issue for Control theory. Having in mind the important uncertainties on the dynamics of the two populations in interaction, we attempt here to identify general ideas for building release strategies, applicable to various models and situations. These principles are exemplified by two interval observer-based feedback control laws whose stabilizing properties are demonstrated when applied to an ODE model retrieved from [1]. Crucial use is made of the theory of monotone systems [3]. See [2] for details.

References

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