

1098-93-225

Thomas I Seidman* (seidman@umbc.edu). *Optimal boundary control of a reaction/diffusion/switching system*. Preliminary report.

We consider a bioreactor with diffusing bacteria, individually subject to hysteretic switching between dormant and active modes when encountering thresholds in the local level of a critical nutrient. This nutrient is provided at the boundary and then diffuses in the region so one has PDEs for the bacteria and nutrient concentrations coupled with pointwise ODEs for the pollutant to be cometabolized. Note that this is not a standard hybrid control problem since the modal index must be obtained for the continuum of individual bacteria. (Received January 26, 2014)