

CONTROLLING THE SPREAD OF INVASIVE BIOLOGICAL SPECIES

MARIA TERESA CHIRI

We consider a controlled reaction-diffusion equation, modeling the spreading of an invasive population. Our goal is to derive a simpler model, describing the controlled evolution of a contaminated set. We first analyze the optimal control of 1-dimensional traveling wave profiles. Using Stokes' formula, explicit solutions are obtained, which in some cases require measure-valued optimal controls. Then we introduce a family of optimization problems for a moving set and show how these can be derived from the original parabolic problems, by taking a sharp interface limit. In connection with moving sets, we show some results on controllability, existence of optimal strategies, and necessary conditions.

This is a joint work with Prof. Alberto Bressan and Dr. Najmeh Salehi (Penn State).

REFERENCES

- [1] A. BRESSAN, M. T. CHIRI, AND N. SALEHI, *On the optimal control of propagation fronts*, Math. Models & Methods in the Applied Sciences, *to appear*.
- [2] A. BRESSAN, M. T. CHIRI, AND N. SALEHI, *Optimal control of moving sets*, *submitted*.