

1107-35-245

E. M. Lunasin* (lunasin@usna.edu), United States Naval Academy, Department of Mathematics, 572C Holloway Road, Chauvenet Hall, Annapolis, MD 21402, and **E. S. Titi**, Department of Mathematics, Texas A&M University, College Station, TX 77843. *Finite determining parameters feedback control for distributed nonlinear dissipative systems – a computational study.*

We present a numerical study of a new algorithm for controlling general dissipative evolution equations using determining systems of parameters like determining modes, nodes and volume elements. We implement the feedback control algorithm for the Chafee-Infante equation, a simple reaction diffusion equation and the Kuramoto-Sivashinsky equation, a model for flame front propagation or flowing thin films on inclined surface. Other representative applications include catalytic rod, chemical vapor deposition and other defense-related applications. We also discuss stability analysis for the feedback control algorithm and derive sufficient conditions, for the stabilization, relating the relaxation parameter, number of controllers and sensors, and other model parameters. (Received January 16, 2015)