1077-VG-304 **Laura K. Gross*** (`laura.gross@bridgew.edu`), Department of Mathematics & Computer Science, Hart Hall Room 228, Bridgewater State University, Bridgewater, MA 02325, and **Yi Yang** and **Jun Yu**. *Linear instability in a combustion problem.*

We describe the propagation of a reaction such as solid combustion, explosive solidification, and certain other exothermic phenomena using a simple conceptual model. In the model, a system of heat equations in the reacted and unreacted regions is subject to boundary conditions, including a nonlinear kinetic condition posed at the reaction front. The system supports steady propagation in certain parameter regimes. We present a linear analysis for the loss of stability in a one-dimensional problem. We show how the stability threshold depends on the disparities between material parameters in the reacted and unreacted regions. (Received August 19, 2011)