

1116-VM-2269 **Laura K. Gross*** (laura.gross@bridgew.edu), Mathematics Department, Bridgewater State University, Bridgewater, MA 02325, and **Jun Yu, Yi Yang** and **Kewang Chen**. *On a generalized free-interface model of solid combustion.*

We develop a generalized free-interface model to describe the propagation of a reaction such as solid combustion, explosive solidification, and certain other exothermic phenomena. In particular, from a reaction-diffusion model we derive a system of heat equations in the reacted and unreacted zones, subject to boundary conditions, including conditions posed at a sharp reaction front. This model contains a ratio of thermal diffusivities in the product and reactant and has limiting cases that reproduce two models from the literature. We present numerical studies of the nonlinear dynamics of the generalized model. (Received September 22, 2015)