Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Evolution of a Mushy Zone on a Finite Domain NICHOLAS GEWECKE, University of Delaware, TIM SCHULZE, University of Tennessee —
Mushy zones are regions of intermixed liquid and solid which result from instability due to the build-up of solute during solidification of multispecies materials. Transient dynamics in the case of a very cold lower boundary for a finite-depth tank lead to variations in the amount of solute which is frozen into the solid, which contrasts with the dynamics on an infinite domain. Furthermore, the growth of the solid layer eventually leads to the elimination of the mushy layer over very long time scales, which may be of interest in geological settings such as solidification of sea ice or magma chambers.

Nicholas Gewecke
University of Delaware

Date submitted: 04 Aug 2011 Electronic form version 1.4