1051-76-43 **Mallikarjunaiah S Muddamallappa** and **Dambaru Bhatta*** (`bhattad@utpa.edu`), Department of Mathematics, The University of Texas-Pan American, 1201 West University Drive, Edinburg, TX 78539, and **Daniel N Riahi**. *On convective instability & transition to turbulence in a mushy layer.* Preliminary report.

The problem of nonlinear convective flow in a mushy layer with permeable mush-liquid interface is studied under operating conditions for an experiment. A Landau type nonlinear evolution equation for the amplitude of the stationary mode, which is based on the Landau theory and formulation for the Rayleigh number close to its critical value, is developed. Using numerical and analytical methods, the solutions to the evolution equation were calculated for both supercritical and subcritical conditions. The results including those about the types of transition to turbulence that can occur in such a flow system are discussed. (Received August 04, 2009)