Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Two Phase Compressible Flow Fields in One Dimensional and Eulerian Grid Framework SUNGSU LEE, Chungbuk National Univ., CHAN WOOK PARK, Daebul Univ. — Numerical investigation for two phase compressible flow fields of air-water in one dimensional tube are performed in the fixed Eulerian grid framework. Using an equation of states of Tait's type for a multiphase cell, the two phase compressible flow is modeled as equivalent single phase which is discretized using the Roe's approximate Riemann solver, while the phase interface is captured via volume fractions of each phase. The most common problem found in the computational approaches in compressible multiphase flow is occurrence of the pressure oscillation at the phase interface. In order to suppress that phenomenon, tried are two approaches; a passive advection of volume fraction and a direct pressure relaxation with the compressible form of volume fraction equation. The results show that the direct pressure equalizing method suppresses pressure oscillation successfully and generates sharp discontinuities, transmitting and reflecting acoustic waves naturally at the phase interface. This work was supported by a research fund granted from Agency for Defense Development, South Korea

Sungsu Lee
Chungbuk National Univ.

Date submitted: 04 Aug 2008 Electronic form version 1.4