

Abstract Submitted  
for the DFD06 Meeting of  
The American Physical Society

**Pressure and volume fraction calculation in particle-in-cell method for multiphase flows**<sup>1</sup> DUAN ZHANG, QISU ZOU, BRIAN VANDERHEYDEN, Los Alamos National Laboratory — Particle-in-cell method, especially its later development, possesses significant advantages in solving problems with history dependent constitutive relations. This method avoids numerical diffusion problems of Eulerian methods and mesh distortion issues of Lagrangian methods. Recently we have combined this method with multiphase flow theories to study fluid-structure interactions. Numerical error associated with the method for volume fraction is of the first order in the spatial discretization. We will show that this error results in failure in pressure calculation if the traditional way, enforcing the sum of the volume fraction to be one, is used. An alternative method using evolution equations for the volume fraction is introduced.

<sup>1</sup>This work is supported by DOE

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Date submitted: 03 Aug 2006

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