Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Hydrogen-Helium Mixtures under Giant Gas Planet Conditions
JAN VORBERGER, Geophysical Laboratory, Carnegie Institution of Washington, Washington D.C., ISAAC TAMBLYN, STANIMIR A. BONEV, Dalhousie University, Halifax, Canada , BURKHARD MILITZER, Geophysical Laboratory, Carnegie Institution of Washington, Washington D.C. — We use density functional molecular dynamic simulations to investigate equilibrium properties of mixtures of hydrogen and helium. We consider a range of temperature, density and mixing ratio which enables us to study the equation of state for these mixtures under extreme conditions relevant, e.g., for giant gas planets. We focus on the atomic and molecular phase of hydrogen helium mixtures. We consider the structure of the liquid and how the presence of helium influences the bond length and suppresses the dissociation of the hydrogen molecules. We present binary distribution functions illustrating that helium leads to lower dissociation in the system. We will demonstrate constraints concerning the validity of the linear mixing rule. We will show comparisons to different methods and present results for Jupiters isentrope.

Jan Vorberger
Geophysical Laboratory, Carnegie Institution of Washington, Washington D.C.

Date submitted: 12 Jan 2006 Electronic form version 1.4