Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Modeling H_2-Surface Interactions on Interstellar Dust Grains: A Classical Molecular Dynamics Study[1] VIJAY VEERAGHATTAM, STEVEN LEWIS, PHILLIP STANCIL, University of Georgia, JUNKO TAKAHASHI, Meiji Gakuin University — A classical Molecular Dynamics (MD) method is employed to model hydrogen molecules interacting with the surface of amorphous ice and to calculate the sticking coefficient as a function of various system parameters. This study, combining molecular physics and surface science, is part of a larger program of research to provide theoretical input for models of dust-grain-mediated physico-chemical processes in the interstellar medium. Many dust-grain species are thought to be clad in amorphous ice, which motivates the choice of substrate for this study. Our method simulates the various dynamical processes associated with H_2-ice scattering events, including collision, sticking, diffusion, and ejection. Variables such as angle of incidence, molecular rotational state, substrate temperature (T_D), and H_2 temperature (T_{H_2}) are monitored and allowed to vary. In this talk, we will present our results for the H_2-ice sticking coefficient as a function of T_D and T_{H_2}.

[1]This project is supported by NASA grant NNG06GJ11G from the Astrophysics Theory Program.

Vijay Veeraghattam
University of Georgia

Date submitted: 17 Nov 2008 Electronic form version 1.4