Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Close-coupling study of rotational energy transfer in H_2O collisions with He atoms[1] BENHUI YANG, PHILLIP STANCIL, University of Georgia, DEPARTMENT OF PHYSICS AND ASTRONOMY TEAM — Due to the astrophysical importance of water and helium, the H_2O-He collisional system has been the subject of numerous experimental and theoretical studies. For numerical astrophysical models, quantitative determinations of state-to-state cross sections and rate coefficients for H_2O-He collisions are crucial. In this work quantum close-coupling scattering calculations of rotational energy transfer (RET) of rotationally excited H_2O due to collisions with He are presented for collision energies between 10^{-6} and 1000 cm^{-1} with para-H_2O initially in levels $1_{1,1}$, $2_{0,2}$, $2_{1,1}$, $2_{2,0}$, and ortho-H_2O in levels $1_{1,0}$, $2_{1,2}$, $2_{2,1}$. Differential cross section, quenching cross sections and rate coefficients for state-to-state RET were computed on three new H_2O-He potential energy surfaces (PESs). The inelastic and elastic differential cross sections are also compared with available experimental measurements.

[1]We acknowledge support from NASA grant NNG04GM59G.

Benhui Yang
University of Georgia

Date submitted: 02 Feb 2007 Electronic form version 1.4