Abstract Submitted
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Energy Transfer in Molecular Gas-Surface Interactions HAILEMARIAM AMBAYE, J. R. MANSON, Department of Physics and Astronomy, Clemson University — A theoretical study of energy accommodation, momentum accommodation and reduced force coefficients for the diatomic molecular gases O_2, N_2 and H_2 scattering from Au, Al and SiO_2 surfaces has been carried out. The theory is a mixed classical-quantum formalism which includes energy transfer between the surface and molecule through translational motion and internal molecular rotational and vibrational excitations. The translational and rotational degrees of freedom are treated classically while the molecular internal vibrational excitation is treated quantum mechanically with a semiclassical formalism. The accommodation coefficients and force constants are calculated as functions of the surface temperature, incident beam angle, incident energy, and mass ratio of the incident molecule to the surface substrate atomic mass. The calculations are calculated with recent experimental data and show good agreement in general.

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