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Inelastic Scattering and Sticking of Light Particles on Surfaces*

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We develop a general theory for the inelastic surface scattering of light particles such as He, H and H_2 at thermal energies. This theory can be used to obain inelastic differential reflection coefficients for scattered particles, the thermal attenuation of elastic difraction intensities, and the capture and sticking probabilities for adsorption by the surface bound states.

Calculations for H_2 scattering from Cu (100) show structure in both the sticking coefficients and specular beam that is similar to that observed experimentally [1]. This structure arises from direct scattering into the bound states and is not associated with resonant processes. We also discuss the dependence of elastic resonant scattering of nelastic energy exchange, and the role of resonant scattering in the sticking process.

References

1. Anderson, S. L. Wilzen and J. Harris. — Phys. Rev. Letters, 57, 1603 (1986).

* This work was reported at the Euromech 224, Kardjali 1987. The full text was not presented.