

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Measured Impact of core electrons on Van der Waals potentials¹

CATHERINE KLAUSS, VINCENT P.A. LONIJ, WILLIAM F. HOLMGREN, IVAN HROMADA, ALEX D. CRONIN, University of Arizona — We measured atom-surface Van der Waals potentials (C_3 coefficients) for Li, Na, K, and Rb atoms by studying diffraction from a nanograting. By focusing on ratios of C_3 , we eliminate systematic errors due to the geometry and roughness of the nanograting. We measured the ratio $C_3^K/C_3^{Na} = 1.544 \pm 0.025$ meVnm³. With this 2% precision, our measurements reveal the contribution of core-electrons to atom-surface interactions. We also show that the permittivity $\epsilon(\omega)$ of the surface does not significantly affect the ratios of C_3 . Therefore our results serve as a good test of atomic structure calculations.

¹NSF Grant No. 0653623

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Date submitted: 08 Feb 2011

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