

Abstract Submitted
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Measurement of atomic diffraction phases induced by material gratings¹ JOHN PERREAULT, ALEXANDER CRONIN, University of Arizona — Atom-surface interactions can significantly modify the intensity and phase of atom de Broglie waves diffracted by a silicon nitride grating. This affects the operation of a material grating as a coherent beam splitter. The phase shifts induced by diffraction are measured by comparing the relative phases of several interfering paths in a Mach-Zehnder Na atom interferometer formed by three material gratings. The values of the diffraction phases are consistent with a simple model which includes a van der Waals atom-surface interaction between the Na atoms and the silicon nitride grating bars.

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