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The Application of High-Order Harmonics to Extreme Ultraviolet Polarimetry NICOLE BRIMHALL, JOHN PAINTER, MATTHEW TURNER, R. STEVEN TURLEY, MICHAEL WARE, JUSTIN PEATROSS, Brigham Young University — We report on the construction of an extreme ultraviolet (EUV) polarimeter based on high-order harmonic generation for characterizing optical surfaces from 8-62 nm. High harmonics as an EUV source are advantageous in that they are polarized (linear, same as laser) and measurements of several wavelengths of light can be made simultaneously. Although not as bright as a synchrotron source, the flux of EUV light is 30,000 times that of a commonly used plasma source. We have demonstrated the feasibility of this project with a simple prototype instrument, which measured the reflectance of samples from 30 nm to 62 nm. The prototype demonstrated that sensitivity is sufficient for measuring reflectances as low as 0.5%. The full instrument employs extensive scanning mobility as opposed to the fixed angle and fixed wavelength range of our earlier prototype. This project represents an authentic 'work-horse' application for high-order harmonics, as opposed to merely demonstrating proof of concept.

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