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Broadband Mirrors for Visible, Infrared, and Ultraviolet Light[1]
MARGARET MILES, DAVID D. ALLRED, R. STEVEN TURLEY, Brigham Young University — One of the proposals for the next generation of NASA space telescopes is the LUVOIR mission. The proposed observatory envisions a large aperture telescope with high reflectance from the visible into the extreme ultraviolet. We will report on work to extend the range of this telescope further into the ultraviolet to enhance its capabilities. Most of the range for the telescope can be achieved with a thin aluminum coating which will have high reflectance in the infrared, visible, and near-UV parts of the spectrum. Unfortunately, the aluminum readily oxidizes when exposed to air effectively limiting reflectance for photons with energies less than about 9 eV. We will discuss studies of the oxidation rate of aluminum under various vacuum conditions and proposals on limiting the oxidation to extend the range to 14 eV. In order to study the development of oxidation, the mirror needs to be fabricated and the reflectance measured in the same vacuum system. We will also discuss a scheme to extend the mirror to be reflective for even higher energy photons up to 30 eV by undercoating the aluminum layer with a multilayer mirror.

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