

Laser Irradiation of Olivine: Space Weathering Effects. M.J. Loeffler (mjl8r@virginia.edu)¹ and R.A. Baragiola (raul@virginia.edu)¹, ¹University of Virginia, Laboratory for Atomic and Surface Physics (LASP), Thornton Hall B113, Charlottesville, VA 22903

Airless bodies, including asteroids, are constantly bombarded by radiation and micrometeorites. These impacts affect the composition and optical properties of the surfaces. Laboratory simulations of impact processes affecting the moon and asteroids, have focused on what is believed to be the two most important types of weathering agents: solar wind radiation (mostly 1 keV H⁺ and 4 keV He⁺ ions) and micrometeorites. In a previous conference, we have presented our results on the effect that the solar wind on surface chemical composition and optical reflectance. The experiments were done, using 4 keV He⁺ on olivine and forsterite powders.¹ Here we present our latest results on the effects of micrometeorite bombardment on olivine powders, simulated using an ultraviolet pulsed laser. We will present results of the irradiation experiments, emphasizing changes in chemical composition, using x-ray photoelectron spectroscopy, and in the spectral reflectance in the visible and near infrared.

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References: [1] Loeffler, M.J., Baragiola, R.A. Ion of Olivine and Forsterite: Space Weathering Effects. DPS 2007