PRIMITIVE ASTEROIDS IN THE UV/BLUE: EXTENDING UV SPACECRAFT SPECTRA WITH GROUND-BASED SPECTRA. F. Vilas[1] and A. R. Hendrix[2], [1]National Science Foundation, [2]Planetary Science Institute (fvilas@nsf.gov).

Introduction: In the next year, two low-albedo - presumed primitive - near-Earth asteroids will be visited and sampled by robotic space probes, returning materials to Earth. Remote sensing, however, remains our primary means of studying the asteroid population of over 700,000 numbered objects. The preparation for future human exploration and utilization of primitive NEAs will be informed by both the results of these missions and the best Earth-based characterization we attain of similar-type asteroids.

Data Sets: We extend UV C-complex asteroid studies of International Ultraviolet Explorer spectra of 13 C-complex asteroids in the ~210- to- 320-nm wavelength range [1] to spectra of 6 main-belt C-complex asteroids (41, 54, 165, 253, 326, 3507) that were obtained using the MMT 6.5-m telescope facility Blue Channel spectrograph, covering the 320- to- 640-nm wavelength range. These asteroids likely contain iron and phyllosilicates and vary in levels of aqueous alteration. The results of our studies in the UV/blue spectral region address two questions. Are there UV/blue spectral attributes that suggest compositional information? Can UV/blue data be used to discern space weathering effects on a C-complex asteroid's surface?

Spectral Differences: The UV dropoff is quite subdued for C-complex asteroids compared to CI and CM meteorite types. We consider the carbon (as graphite) that we expect to contribute as an opaque to the low albedos of the C-complex asteroids. We note differences in the spectral properties at UV wavelengths for asteroids whose VNIR spectra appear the same at longer wavelengths. Significant differences in the absorption exist at wavelengths lower than 400 nm; ground-based spectra sample part of this region. Separate work shows that the UV spectra potentially show the effects of increased carbon in the surface material [2].

Space Weathering: We have shown that space weathering in the S-complex asteroids is evident in the UV/blue spectral region before it is apparent in the VNIR; this is an effect of the presence of iron in olivines [3, 4]. Our modeling supporting the S-complex research, based upon UV/blue observational data, suggests that the effect of adding small amounts of SMFe to particles from both a hypothetical mineral and a terrestrial basalt affects the reflectance at UV/blue wavelengths before the VNIR reddening and diminution of absorption features associated with space weathering [4]. Can space weathering be the root of the differences between C-complex asteroid and CI/CM meteorite reflectance spectra? Most CM2 carbonaceous chondrites have chondrules containing ~ 20 volume % olivines [e.g., 5]; no spectrum of the chondrule contents of CM2 meteorites has been obtained. We report our most recent results.

References: [1] Roettger, E. E., and Buratti, B. J. (1994), Icarus, 112, 496 . [2] Hendrix, A. R., and Vilas, F. (2018), LPSC 49th, 2845. [3] Hendrix, A. R., and Vilas, F. (2006), AJ, 1396 – 1404. [4] Vilas, F., and Hendrix, A. R. (2015), AJ, 150, 64. [5] Howard, K. T. et al. (2015), *GeochimCA*, 149, 206 – 222.

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