WIDE-FIELD ULTRAVIOLET SPECTROMETER FOR PLANETARY EXOSPHERES AND THERMOSPHERES. Matthew O. Fillingim[1], Edward H. Wishnow[1], Tim Miller[1], Jerry Edelstein[1], Robert J. Lillis[1], Eric Korpela[1], Scott England[1], William Van Shourt[1], Oswald Siegmund[1], Jason McPhate[1], Sasha Courtade[1], David W. Curtis[1], Justin Deighan[2], Michael Chaffin[2], Abdalla Harmoul[3] and Hessa Rashid Almatroushi[3], [1]University of California, Berkeley, Space Sciences Laboratory, 7 Gauss Way, Berkeley, CA, USA, 94720 (matt@ssl.berkeley.edu), [2]University of Colorado at Boulder, Laboratory for Atmospheric and Space Physics, 1234 Innovation Drive, Boulder, CO, USA, 80303, [3]Mohammed Bin Rashid Space Center, Al Khawaneej Street, Al Khawaneej, Dubai, United Arab Emirates.

Introduction: Understanding the composition, structure, and variability of a planet's upper atmosphere – the exosphere and thermosphere – is essential for understanding how the upper atmosphere is coupled to the lower atmosphere, magnetosphere and near-space environment, and the Sun. Ultraviolet spectroscopy can directly observe emissions from constituents in the exosphere and thermosphere. From such observations, the structure, composition, and variability can be determined.

We will present the preliminary design for a wide field ultraviolet imaging spectrometer for remote sensing of planetary atmospheres. The imaging spectrometer achieves an extremely large instantaneous 110 degree field of view with no moving scanning mirror. The imaging resolution is very appropriate for extended atmospheric emission studies, with a resolution of better than 0.3 degrees at the center to 0.4 degrees at the edges of the field. The spectral range covers 120 - 170 nm, encompassing emissions from H, O, C, N, CO, and N_2, with an average spectral resolution of 1.5 nm. The instrument is composed of a 2-element wide-field telescope, a 3-element Offner spectrometer, and a sealed MCP detector system contained within a compact volume of about 40 x 25 x 20 cm. We will present the optical and mechanical design as well as the predicted optical performance.

The wide instantaneous FOV simplifies instrument and spacecraft operations by removing the need for multiple scans (either from a scan mirror or spacecraft slews) to cover the regions of interest. This instrumentation can allow for two-dimensional spectral information to be built up with simple spacecraft operation or just using spacecraft motion. Applications to the terrestrial geocorona and thermosphere will be addressed as well as applications to the upper atmospheres of other planetary objects.