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**Comparison of Neutral Planetary Atmospheres with Space Weather Events** BO JOHNSON, JAN SOJKA, Utah State University — The purpose of this study was to understand the effects of space weather events on neutral planetary atmospheres. We began with neutral species profiles for Venus through Saturn (involving the three or four most abundant species). We assumed that incoming sunlight was from a blackbody and is the heat source for the atmospheres. Our analysis focused on solar noon, while assuming upper atmospheres were in hydrostatic equilibrium and the neutral temperature at given altitudes was approximately constant. The solar irradiance in the extreme ultraviolet (EUV) and x-ray spectra were assumed to create the dayside ionosphere of the planets by ionizing the atmospheres. After gathering the absorption and ionization cross sections of the atmospheric species in the EUV and x-ray wavelengths, we computed the photon absorption rate from the tops of the atmospheres and the local photon energy deposition rates. In all our planetary atmospheres, the lower atmosphere is protected from space weather solar flares by upper atmospheric absorption of the x-ray photons. This barrier is at a well-defined altitude region called the Sun-atmosphere-interaction-region (SAIR). The local neutral thermal energy content was also calculated. These results were compared with conditions occurring during a hypothetical space weather solar flare event in which the smallest x-ray wavelengths used were increased by a factor of 1000. Future study will develop an understanding of ionization in creating E-regions in planetary ionospheres.

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