# The Response of High Energy Photoelectrons in the Martian Atmosphere to Variable Solar Input

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The MAVEN mission aims to understand the processes by which Mars has been losing atmosphere over time by analyzing data taken from different levels of the Martian atmosphere, as well as solar driver data. In this project, we isolate data taken from the ionosphere to study high energy electrons created by a particular ionization process called the Auger effect which occurs when soft x-rays ionize atmospheric gases. In particular, we focus on electrons that are ionized from CO2 molecules and atomic O from solar irradiance in the 0.1 - 6 nm range. Thus far, the portion of the solar spectrum which produces Auger electrons has been sparsely measured and is poorly understood. In an effort to validate solar irradiance models from 0.1- 6 nm, we utilize data from two instruments on board the MAVEN spacecraft, EUVM (the Extreme Ultraviolet Moniter) and SWEA (the Solar Wind Electron Analyzer), and compare these observed data sets to two different models, MAVEN SynRef, and Flare Irradiance Spectral Model (FISM) for Mars (-M). SynRef is a version of the SORCE XPS model modified to be used by MAVEN/EUVM, and FISM-M is a version of the FISM proxy model previously developed for Earth irradiance and modified to be used by MAVEN/EUVM. Our method of comparison is simply to find the Pearson correlation between the data and the models over a given month of 2015. By filtering the SWEA data for different altitudes and solar zenith angles, we are able to analyze how Auger electrons react under different circumstances. Generally, a peak was found at 449 eV, which is 52 eV lower than expected for CO2. When looking at a range of energies around this peak, FISM, although it is a coarser model, agrees slightly better with the observed data than SynRef.