

R005-58

Zoom meeting C : 11/3 AM2 (10:45-12:30)

11:45-12:00

Modeling of EUV light scattered by oxygen ions and comparison with observation

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An imager of ISS-IMAP observed extreme ultraviolet (EUV) at 83.4 nm, which is scattered by oxygen ions (O⁺), even in the umbra of the Earth. However, the single scattering of solar EUV radiation in the upper atmosphere does not well explain the observation. We are developing a computational model for simulating multiple scattering of EUV by O⁺ ions. This model simulates EUV flux using a Monte Carlo method in which trajectories of a large number of EUV photons are computed. The scattering cross section is determined according to the O⁺ distribution and ion temperature which are given by the IRI model. The change in the EUV frequency of a photon is assumed to obey a Gaussian distribution which is derived from thermal motion of O⁺ ions. For simplicity, the mean of this Gaussian distribution is assumed to be independent of the EUV frequency before the scattering.

We have simulated EUV flux in the ionosphere using our Monte Carlo model and compared with some observational results. At present, EUV flux is not necessarily well reproduced. However, some features of EUV flux on the nightside, which were observed by the EUV imager of ISS-IMAP, are reproduced by assuming a large scattering cross section. The prospect for estimating O⁺ density distribution will also be discussed.