

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)

Planetary Upper Atmospheres, Ionospheres and Magnetospheres (C32)

VARIABILITY OF THE IONOSPHERE OF MARS

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The ionosphere of Mars consists of three main regions: topside, main layer and lower layer. Plasma densities in the main and lower layers are controlled by photochemical processes alone, whereas plasma densities in the topside are influenced by transport as well. Plasma in the main layer is produced by the absorption of EUV photons and plasma in the lower layer is produced by the absorption of X-ray photons. This presentation will describe observations of variability in these three ionospheric regions. It will also address the physical causes of variability and the ability of models to accurately reproduce ionospheric observations. Spatial fluctuations (waves) in the topside region have been attributed to solar wind effects. The topside structure also has some dependence on crustal magnetic fields. Variations in the altitude and width of the main layer, which are controlled by the neutral atmosphere, have been observed. Variations in plasma densities in the main layer, which are controlled by EUV flux, and in plasma densities in the lower layer, which are controlled by X-ray flux, have also been observed.