



## **Describe Martian ionospheric electron density profiles with double quasi-Chapman layers**

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Most of the observations to the Martian ionosphere reveal that the Martian ionosphere is composed of two layers, an upper layer and a lower layer. The upper layer is apparently in a photo-equilibrium although the Martian ionosphere is no longer controlled by the photochemical processes at higher altitude (about one neutral scale height above the peak), while the lower layer is believed to be a photochemical one. This provides the possibility to describe the electron density profile with two Quasi-Chapman Layers (QCL). The Martian ionosphere data measured by the Mars Global Surveyor(MGS) Radio Science(RS) experiment are analyzed, and most of the obtained profiles can be sufficiently fitted by two QCLs. The results not only provide an experiential description for the Martian ionosphere, further investigation also shows that this description is physically understandable. With this description, it is possible to derive the Martian ionospheric profiles at the solar zenith angle less than 45 degrees which cannot be provided by the radio occultation experiments. The profiles at lower solar zenith angle will of course help the understanding to the whole Martian ionosphere and are also helpful for Mars probes in the future.