



Build a model describing the topside electron density profiles

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Observations from the ROCSAT-1 satellite and an ionosonde operated at Wuhan (30.5° N, 114.4° E), a low latitude station in China, have been collected together to build an empirical model to reproduce the variations of topside ionospheric electron density.

In the model, Wuhan ionosonde records provide ionospheric F-layer peak parameters (peak electron density and its height), and ROCSAT-1 observations give the plasma density at altitude ranging from 570-650 km. A Chapman function profile is assumed to bridge the profile at altitudes between the F layer peak to the ROCSAT-1. The model reproduces the variations of electron density in the topside ionosphere as function of local time, day of the year, solar activity, and altitude under quiet geomagnetic conditions. Furthermore, the Chapman scale height is derived and compared with that given by the SAO-explorer software from the ionogram records at Wuhan.

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