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Poster
The ionosphere electron density provides valuable information about the ionospheric physical condition. Radio Occultation (RO) is one of the most novel satellite approaches for the study of the ionospheric electron densities which uses the combination of Global Navigation Satellite Systems (GNSS) and Low Earth Orbiting (LEO) satellites to determine ionospheric electron density profiles with high vertical resolutions. This study aims at developing a multi-dimensional model of the electron density derived from ionospheric GPS radio occultation measurements by FORMOSAT-3/COSMIC satellites. In this research, In order to model the electron density in longitude, latitude and time, the three-dimensional base functions has been defined as the tensor product of the spherical slepian function for the longitude and latitude and the polynomial B-spline function for time. In this case for height dependency Chapman profile function has been used to express the height variations of the electron density. The parameters of the Chapman function namely the maximum electron density of the F2 layer (NmF2), the corresponding F2 peak height (hmF2) have been modeled. The unknown parameters have been estimated by least-squares adjustment. Validations show that this model approach has significant potential and the ability to yield reliable results.
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