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STUDY OF OCCULTATION EVENTS RECORDED BY THE ROSA PAYLOAD, ABOARD MEGHA-TROPIQUES, OVER INDIAN REGION

Abstract

As a radio signal, in space, passes through the dense atmosphere of the earth, a bending is observed in the path of the signal. This bending largely depends on the refractivity of the atmosphere at the place which in turn depends on the atmospheric condition of the atmosphere. The technique of radio occultation (RO) exploits this physical phenomenon of bending of the radio signals in the earth's atmosphere to produce the atmospheric parameters. The Global Positioning System (GPS) signals bend as it pass through the earth's atmosphere and is detected by a low earth orbit (LEO) satellite which is not in the direct line of sight of the GPS satellite. Thus, from the phase shift and using the position of the GPS and LEO satellite, the atmospheric parameters can be estimated.

The atmospheric condition over the tropical region is known to affect the climatic condition of the globe. In this view, Indian Space Research Organization (ISRO) launched the *Megha-Tropiques* mission in collaboration with Centre National d'Etudes Spatiales (CNES), France for studying the water cycle and energy exchanges in the tropical region. One of the four payloads, it carried, was the Radio Occultation Sounder of Atmosphere (ROSA) procured from Thales Alenia Space, Italy. The ROSA payload has been streaming data successfully. Attempts are being made to extract the RO information from the ROSA data. The atmospheric condition over the Indian region is of interest to the meteorological community of India. So, initially the focus has been on studying the RO events over the Indian region.

In the present paper our study of the occultation events over Indian region is presented. The paper discusses the occultation geometry, the number and distribution of occultation events over the Indian region. Moreover, the study includes the prediction of occultation points for validation of the conventional atmospheric sounding system e.g. Radiosonde. The accuracy of the prediction evaluated with respect to the time and position is also included.