

Global Navigation Satellite System (GNSS) Radio Occultation (RO) is an atmospheric remote sensing method, providing additions to the current weather and climate study. During a RO event, the GNSS signals scrubbing the Earth's atmosphere are delayed and bent before picked up by the GNSS receivers. The collected signal contains the Earth's atmospheric effects and is used to derive atmospheric parameters.

Several aspects in GNSS RO is covered here. The GNSS tracking algorithms are first discussed. Then, we studied the RO inversion algorithms using the tracked signals to obtain atmospheric refractivity profiles, and the error characteristics of the positioning errors' effect on the retrieved refractivity errors. In addition, the GNSS RO's application is extended to planetary boundary layer height (PBLH) detection. A signal amplitude-based method is proposed and verified. It shows advantages such as easy implementation, and avoids some of the assumptions and steps associated with the common refractivity gradient-based method.