

# **COSMIC GPS Radio Occultation Observations: Algorithm Improvements and Science Applications**

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## **ABSTRACT**

The launch of the Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) in April 2006 revolutionized the study of the global ionosphere using space-based navigation signals. By using the technique of Global Positioning System (GPS) radio occultation (RO), the COSMIC provides near global sampling of the ionosphere electron density from ~100 to 800 km, with a high vertical resolution. This presentation will provide an overview of recent improvements in the processing of ionospheric GPS RO observations within the COSMIC Data Analysis and Archive Center (CDAAC). In particular, we have recently implemented an improved electron density inversion that does not rely on the Abel inversion. Other developments include a soon to be released monthly mean ionospheric reanalysis based on combining multiple low-Earth orbit missions and ground-based GPS observations. Select highlights of the application of COSMIC GPS RO ionosphere observations for scientific studies will also be presented. Finally, a status update of the COSMIC-2 mission will be presented.

**Key words:** COSMIC, radio occultation, GNSS. (Up to six)