

GPS L2C Tracking of Radio Occultation Signals with the COSMIC Receiver

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Remote sensing of the neutral atmosphere and ionosphere with the GPS radio occultation technique requires robust tracking of rapidly fluctuating L1 and L2 signals in a low signal-to-noise ratio environment. The JPL-developed COSMIC GPS receiver has been shown to reliably track the L1 C/A signal throughout an occultation event in both closed-loop and open-loop modes, but the semi-codeless L2P closed-loop tracking occasionally experiences reduction in signal-to-noise ratio, tracking errors and loss-of-lock that limit usefulness of the L2 signal for ionospheric correction in neutral atmospheric inversions. JPL and UCAR have recently tested new GPS receiver firmware on the COSMIC satellites that tracks L2C signals in both closed-loop and open-loop modes. This presentation will show examples of tracked L2C closed-loop and open-loop signals and will quantify the improvements of L2C tracking in terms of signal-to-noise ratio, reduction of tracking errors, and improved ionospheric correction.