

Ionospheric Imaging with Low-Earth Orbiters Tracking GPS

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Occultation measurements taken from low Earth orbiters (LEO's) tracking GPS, such as in the GPS/MET experiment, provide a very powerful tool for monitoring the ionosphere. Each occultation can be processed individually to obtain a profile of electron density near the perigee of the occulting ray, or an ensemble of occultations can be processed collectively in a tomographic approach to obtain a 3-D field of electron density.

We provide an overview of different strategies for mapping the ionosphere with GPS occultation measurements, including the use of single (L1) or dual phase (L1 and L2) measurements, the use of the Abel transform to obtain individual electron density profiles. The inclusion of GPS ground data, and tomographic approaches, with a discussion of the inclusion of *a priori* data and constraints on the electron density solution. Results from analysis of GPS/MET data with various strategies will be presented, and compared to ionospheric beacon and other ionospheric measurements such as ionosondes and incoherent scatter radar. Temporal and spatial resolution issues as a function of the number of LEO's will be discussed.

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