Ionospheric Imaging with Low-Earth Orbiters Tracking GPS

Larry J. Romans; George A. Bajji (Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109; ph (818) 354-5809; e-mail: ljr@cobra.jpl.nasa.gov)

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 resolution. Results from analysis of GPS/MET data with both strategies will be presented, and compared to ionospheric models, 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.

American Geophysical Union
Abstract Form

Reference # 0000
Session 0.00

1. 1996 Spring Meeting
2. 11606774
3. (a)
   Larry J. Romans
   Jet Propulsion Laboratory
   California Institute of Technology
   Pasadena, California 91109 USA
   ljr@cobra.jpl.nasa.gov
   (b) (818) 354-5809
   (c) (818) 399 1965
4. G
5. (a) G02
   (b) 2494, 6934, 6982
6. N/A
7. 0% published elsewhere
8. Charge $50 to Larry J. Romans
   VISA card ????  ????  ????  ????
   expires 09/98
9. N/A
10. No special instructions
11. Regular author

Date received: 25 JUL 95
Date formatted: February 29, 1996
Form version: 1.3