

Ionospheric Signatures in Radio Occultation Data

Anthony J Mannucci¹, Chi O Ao¹, Byron A Iijima¹, E. Robert Kursinski²

¹*Jet Propulsion Laboratory, California Institute of Technology*

²*University of Arizona*

tony.mannucci@jpl.nasa.gov

The GPS radio occultation (RO) technique of remote sensing is now spanning 16 years, having begun in 1995 with the GPS/MET satellite experiment. The value of extending the radio occultation record to the GPS/MET era has been demonstrated in recently published studies of climate trend detection and attribution. The challenging nature of observing climate requires particular care to characterize subtle effects that can bias the measurement record over decadal time scales. Of particular interest is the ionospheric residual bias, which varies due to the 11-year solar cycle. We are developing algorithms for calibrating ionospheric effects with only a single GPS transmission frequency, permitting us to process the GPS/MET data record throughout the nearly two years of mission lifetime, thus improving the robustness of trend analysis. We will present results comparing single and dual-frequency retrievals. Additional remarks are planned regarding the influence of small-scale ionospheric structure on the results.