Sensing Integrated Water Vapor Along GPS Ray Paths (1997)

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Sensing integrated water vapor along GPS ray paths

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Abstract. We demonstrate sensing of integrated slant-path water vapor (SWV) along ray paths between Global Positioning System (GPS) satellites and receivers. We use double differencing to remove GPS receiver and satellite clock errors and 85-cm diameter choke ring antennas to reduce ground-reflected multipath. We compare more than 17,000 GPS and pointed radiometer double difference observations above 20o elevation and find 1.3 mm rms agreement. Potential applications for SWV data include local and regional weather modeling and prediction, correction for slant wet delay effects in GPS surveying and orbit determination, and synthetic aperture radar (SAR) imaging. The method is viable during all weather conditions.

[See attached .pdf file for more.]

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