GPS Surveying with 1mm Precision Using Corrections for Atmospheric Slant Path Delay (1997)

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GPS surveying with 1 mm precision using corrections for atmospheric slant path delay

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Abstract. Multipath and atmospheric effects can limit GPS surveying precision. We surveyed a 43 km baseline using large diameter choke ring antennas to reduce multipath and pointed radiometer and barometric data to correct for atmospheric slant delay. Based on 11 daily solutions, atmospheric slant delay corrections improved vertical precision to 1.2 mm rms and horizontal precision to sub-mm. Applications for high precision GPS surveying include deformation monitoring associated with earthquake and volcanic processes, subsidence, isostasy, and sea level measurements; monitoring of atmospheric water vapor for climate and global change research, and to improve the resolution of synthetic aperture radar; calibration of satellite altimeters; and precise satellite orbit determination.

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