

Quality Control of GPS-ZTD using time series combination

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When using observations in an application, quality control of observations is essential. GPS Zenith Total Delay (ZTD) observations are estimated by processing time delay observables from a network of GPS receivers. Several GPS sites are processed by different analysis centers using different networks, different processing software and/or different processing settings.

The method discussed in this paper provides combined troposphere estimates along with their standard deviations based on the different solutions. Besides time series biases, the method determines time series weights to maintain the consistency of combined solutions applying the principles of variance component estimation. Both the time series biases and the weights are determined using a Kalman filter. In this case, estimates obtained at the previous step of time series combination are used as the apriori information for the next step.

The method is applied routinely to the datastream set up in the projects TOUGH and EGVAP. In this way a quality control system purely based on the GPS observations can be implemented. This will increase the confidence in quality of GPS ZTD observations.