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Statistical properties of the tropospheric parameters estimated by GPS

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Within the last decade, the GPS (GNSS) has proved to be a useful tool for observing the troposphere. To be realy suitable for the exploitation in numerical wheather models, the tropospheric product should be provided routinely in near-real time. That was already achieved within various projects, such as COST-716 or TOUGH in Europe. Geodetic Observatory Pecný (GOP) has contributed to these perojects since 2000.

This paper provides an insight into the statistical properties of the tropospheric products (ZTD, zenith total delays) estimated at GOP in near-real time. Besides a brief standard comparison of the near real-time product with respect to the precise post-processing GPS results, the numerical weather models and the radiosonde observations, this contribution pays attention to the systematic errors and the periodical effects of these results. They were evaluated on a long-term basis with respect to study the impact from changing GPS constellation, and subdaily and seasonal variations of the GPS ZTD and radiosonde differences. Finally, the distributions and the power spectra of the ZTD errors (differences) are presented.