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The Belgian contribution to the EUMETNET GPS water vapor program (E-GVAP): recent developments and applications

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Water vapor plays a crucial role in several atmospheric processes and particularly it is a key parameter in weather prediction and climate research. The EUMETNET GPS water vapor program (E-GVAP) has been setup in order to collect on the European scale ground based GNSS tropospheric delay estimates in near real-time and to provide this information to its EUMETNET partners for operational meteorology. Within E-GVAP the geodetic community operates several GNSS data analysis centers which provide the high accuracy tropospheric estimates to the meteorological community. Among these analysis centers, the Royal Observatory of Belgium (ROB) assures the Belgian contribution to E-GVAP by providing near real-time tropospheric delay estimates for a regional network of more than 120 stations spread all over Europe. In this presentation we focus on the recently updated procedures developed by the ROB to satisfy the E-GVAP requirements in terms of latency and quality with as focal point the real-time quality monitoring of the tropospheric parameter estimations which is crucial for ensuring a stable and reliable service. In addition, the sensitivity of the solutions with respect to specific processing options used in the Bernese V5.0 software and recently implemented processing changes like e.g. the introduction of GLONASS data, the introduction of ITRF2005, and the usage of absolute antenna phase center corrections, is investigated. Finally, we address the potential benefit of using data from a very dense GNSS network in order to access small-scale irregularities in the troposphere.