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Real Time Water vapour derived from a dense GPS network and internet broadcasted raw GPS data (NTRIP)

S. de Haan
Royal Dutch Meteorological Institute

Water vapour observations are coarse in the current operational observation network. GPS derived water vapour observations can fill this information gap. Processing GPS to estimate integrated water vapour (IWV) has proven to be a reliable and accurate observing technique. Besides the quality of the observations, latency is a crucial factor for operational use of GPS water vapour.

The general way of processing data is to use hourly batches of raw data from a dense GPS network together with data from some remote GPS sites to obtain long baselines. To obtain real time water vapour observations a continuous data stream is necessary. At KNMI a GPS processing chain has been developed which uses 5 minute data from a dense GPS network in the Netherlands combined with data from a number of NTRIP sites (NTRIP stands for "Networked Transport of RTCM via Internet Protocol"). The current system estimates GPS IWV within 10 minutes of the last observations with an update frequency of 15 minutes and has proven to be very stable.

The GPS IWV are mapped on a two dimensional grid using a variational technique using the previous IWV map as the background field. The quality of the resulting IWV map is good as will be shown through comparisons with water vapour radiometer, radiosondes and GPS water vapour estimates from reference sites.