



A high quality reprocessed ground-based GPS dataset for atmospheric process studies, radiosonde and model evaluation, and reanalysis of HYMEX Special Observing Period

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Data from more than 1000 ground-based GPS receivers in the north-western Mediterranean area have been reprocessed in a consistent way using GIPSY-OASIS II software for the period from 1st September 2012 to 31 March 2013 which encompasses the Special Observation Periods (SOPs) 1 and 2 of the HYMEX project. The reprocessed GPS ZTD data were screened converted to IWV. The ZTD data were used to assess the accuracy of the near real time ZTD data assimilated for operational weather forecasting. The mean of delay differences between the operational and reprocessed solutions is about 0 +/- 3 mm (mean +/- standard deviation of bias over all stations) and the standard deviation of delay differences ranges between 4 and 8 mm. Significant bias reduction is thus expected from a reanalysis ingesting the reprocessed delay data. Various methods and auxiliary data (surface pressure and weighted mean temperature) are investigated for the conversion of ZTD data into IWV. The final IWV dataset is used to evaluate radiosonde humidity observations and operational analyses produced with the AROME model. The spatial and temporal distribution of IWV is also studied with a focus on heavy precipitation events in the north-western Mediterranean area during the HYMEX SOP1.