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Using ground based GPS observations in meteorology - the TOUGH project

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TOUGH (Targeting Optimal Use of GPS Water Vapour Measurements in Meteorology) is a three year scientific intereuropean project funded in part by the EC. 15 institutes are involved, about half representing geodesy and half meteorology. TOUGH started early 2003.

The scope of TOUGH is to optimize the use of ground based GPS observations in meteorology, in particular via assimilation into numerical weather prediction (NWP) models. This we attempt to achieve by improving key links in the chain between the raw ground based GPS observations to the use of the derived GPS atmospheric data at meteorological centres. Among the issues can be mentioned: - Improving processing of GB GPS data into zenith total delay (ZTD). - Characterising statistically the errors of GPS ZTDs - Determining correlations of errors of GPS ZTDs, spatially and timewise. - Improve NWP data assimilation systems to utilise better GPS ZTDs. - Develop data assimilation routines which can correct for the spatial and temporal error correlations of the GB GPS ZTD data. - Enable derivation of GB GPS slant delays from GPS data. - Enable NWP data assimilation of GB GPS slant delays.

The presentation will give an overview of the goals as well as of the achievements obtained so far.