

Integrated Precipitable Water Maps for Northern Italy Obtained from GPS Tropospheric Solutions during MAP SOP Campaign

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This paper presents a meteorological application based on tropospheric correction of the Global Positioning System (GPS) electromagnetic signal.

The wet component (ZWD) of the tropospheric delay in GPS signals is nearly proportional to the quantity of water vapor integrated (IPW) along the signal path and presents typically the largest source of variable atmospheric delay. ZWD is calculated removing the modelled Zenith Hydrostatic Delay (ZHD) from the Zenith Total Delay.

IPW maps are shown and analysed for some IOP events from 1999 MAP/SOP campaign over Northern Italy region. ZTD for the IOP events are obtained from Tropospheric solutions available from IGS Analysis Centers. ZHD are calculated from ECMWF re-analysis available for MAP/SOP campaign. The comparison of such GPS based IPW maps with meteorological analysis of the actual weather processes show a good agreement with temporal and spatial development of synoptic processes.