

A Generalized Scheme to Retrieve Wet Path Delays from WVR Measurements Applied to the European Geodetic VLBI Network

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Abstract

A fluctuation in the water vapor in the atmosphere is one of the largest sources of error of ground-based space geodetic techniques using radio frequencies such as VLBI and GPS. A number of different water vapor radiometer (WVR) instruments are currently deployed for the determination of wet path delays (WPD) to be used as corrections for space geodetic techniques. Although a WVR is an ideal instrument for monitoring the water vapor content in the atmosphere, its benefits for geodetic VLBI have not been demonstrated yet. Site-dependent and frequency-dependent WPD retrieval problems still inhibit the routine use of these corrections. In this study we focused on whether one can find a reliable WPD retrieval scheme that can be applied to the several different microwave radiometers operated at four sites of the European geodetic VLBI network. To validate the WVR measured WPD, which is necessary before introducing the WPD into VLBI data processing, we have used several different WPD inversion methods and compared the resulting WPDs for each site. Finally we discussed a generalized scheme to extract valid WPDs from WVR data for most geodetic stations as a step towards the proposal in the VLBI2010 plan.

[Note from the Editors: The overheads of the oral presentation of this contribution can be downloaded from the IVS 2006 General Meeting web site. Please get the PDF file of the presentation at the URL ftp://ivscc.gsfc.nasa.gov/pub/general-meeting/2006/presentations/gm2006_6-07_cho.pdf.]