Geophysical Research Abstracts
Vol. 14, EGU2012-7636, 2012
EGU General Assembly 2012

Analysis of long time series of reprocessed GPS total column water vapour estimates

O. Bock (1), B. Garayt (2), Y. Bar-Sever (3), and S. Byun (3)

(1) Institut National de l'Information Géographique et Forestière (IGN), Laboratoire LAREG, Marne-la-Vallée, France (olivier.bock@ign.fr), (2) Institut National de l'Information Géographique et Forestière (IGN), SGN, Saint-Mandé, France (bruno.garayt@ign.fr), (3) JPL, CIT, Pasadena, CA, USA (yoaz.e.bar-sever@jpl.nasa.gov, sung.h.byun@jpl.nasa.gov)

Reprocessed GPS data provide accurate and stable estimates of zenith tropospheric delay (ZTD) and total column water vapour (TCWV) estimates. Time series exceeding 15 years become progressively available over the globally distributed continuously-operating International GNSS Service (IGS) network and the European EUREF Permanent Network (EPN). This work aims at assessing the quality of such reprocessed ZTD solutions and using them for climate monitoring and model validation.

First we assessed the quality of three ZTD solutions: (i) the reprocessed tropospheric solution produced at JPL for IGS (repro1, covering period 1995-2007), (ii) the operational IGS tropospheric solution (trop_new, covering period 2001-2010), and (iii) a reprocessed solution produced at IGN (sgn_repro1, covering period 2004-2010). All three solutions show a good overall agreement. Slight differences are due to use of different data processing procedures (e.g. antenna model, mapping function). In several cases, doubtful metadata (e.g. logfile not updated) seems responsible of discrepancies in the operational solution which were corrected during reprocessing. The reprocessed GPS ZTD estimates were converted into TCWV and analysed globally and for different regions, with a focus on timescales pertinent to climate (seasonal cycle, diurnal cycle, etc.). The GPS TCWV estimates were also compared to the ECMWF reanalysis ERA-Interim and overall good agreement is found.