Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03839, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03839
EGU General Assembly 2008

Reanalysis of GPS data at tide gauges

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Tide gauge measurements are one of the primary tools to determine sea level variations. Analysis of tide gauge measurements requires a well defined reference frame. Such reference frame can be realized through precise positions of GPS stations located near tide gauges (TIGA stations). The number of such GPS stations increased from 1 in 1994 till about 210 in 2007 distributed worldwide. A time series of GPS station positions was derived at GFZ Potsdam in 2002 - 2006 using EPOS-Potsdam software. This software has been recently improved. The main improvements include use of absolute satellite and receiver antenna phase centre variations, implementation of IERS Conventions 2003 and ITRF2005 reference frame as an a priori reference frame, FES2004 ocean tide loading model, implementation of a new ambiguity fixing scheme and a new data processing strategy for huge GNSS networks allowing to process GPS data from a few hundred stations in one network solution. Additionally, more data from TIGA stations became available in the recent years. All this requires and allows to perform reanalysis of TIGA GPS data for the period 1994 - 2007. The paper presents a new solution derived at GFZ Potsdam and the results of the comparison with the solutions computed at other TIGA Analysis Centres. The global network of GPS stations processed includes presently about 400 stations.