



Activities and Products at IVS Combination Centre at BKG

Introduction

In the beginning of 2010, the IVS Combination Centre has been established at BKG. The main task is the combination of Earth orientation parameters (EOP) resulting from 24h VLBI rapid experiments (twice a week) and the generation of a long term combined EOP series (four times a year). Within the last months, several activities have been performed at the IVS Combination Centre at BKG in order to improve the current combined products or to develop new products resulting from the combination process. Further developments of the combination strategy allowed the introduction of new products.

Activities and Products

Quarterly solution

The IVS regularly provides a quarterly solution which includes all available 24h sessions in the IVS data centre¹. A “reprocessing” of the IVS sessions back to the 1980s until now aims to generate a consistent long term EOP series regarding apriori values, outlier test etc. Products of the quarterly are EOP series², a terrestrial reference frame based on VLBI observations (VTRF) and station coordinates.

VTRF

The regular generation of a TRF based on VLBI observations contains station coordinates and velocities of VLBI stations and is used as common apriori value for the individual Analysis Centre (AC) solution. The quality of the apriori values for station coordinates directly influences the quality of the network and thus the quality of the resulting EOPs. This is especially important for new VLBI stations and stations which underwent major displacements (e.g. earthquakes). A regular generation of a VTRF allows to react appropriate and with a short delay to these kinds of network changes and to provide new coordinates as soon as enough observations are available for the concerned station. This is one of the advantages of a VTRF compared to the ITRF with an update interval of several years. In the latest VTRF (IVS_TRF2012d.SSC.txt³) several new stations have been included, e.g. YARRA12M, HOBART12 and KATH12M, as well as new coordinates for earthquake affected stations: TIGOCONC and TSUKUB32. Figure 1 shows a plot of the Y-component time series of KATH12M with observation data until 12/2012 (left) and with data until 12/2011 (right).

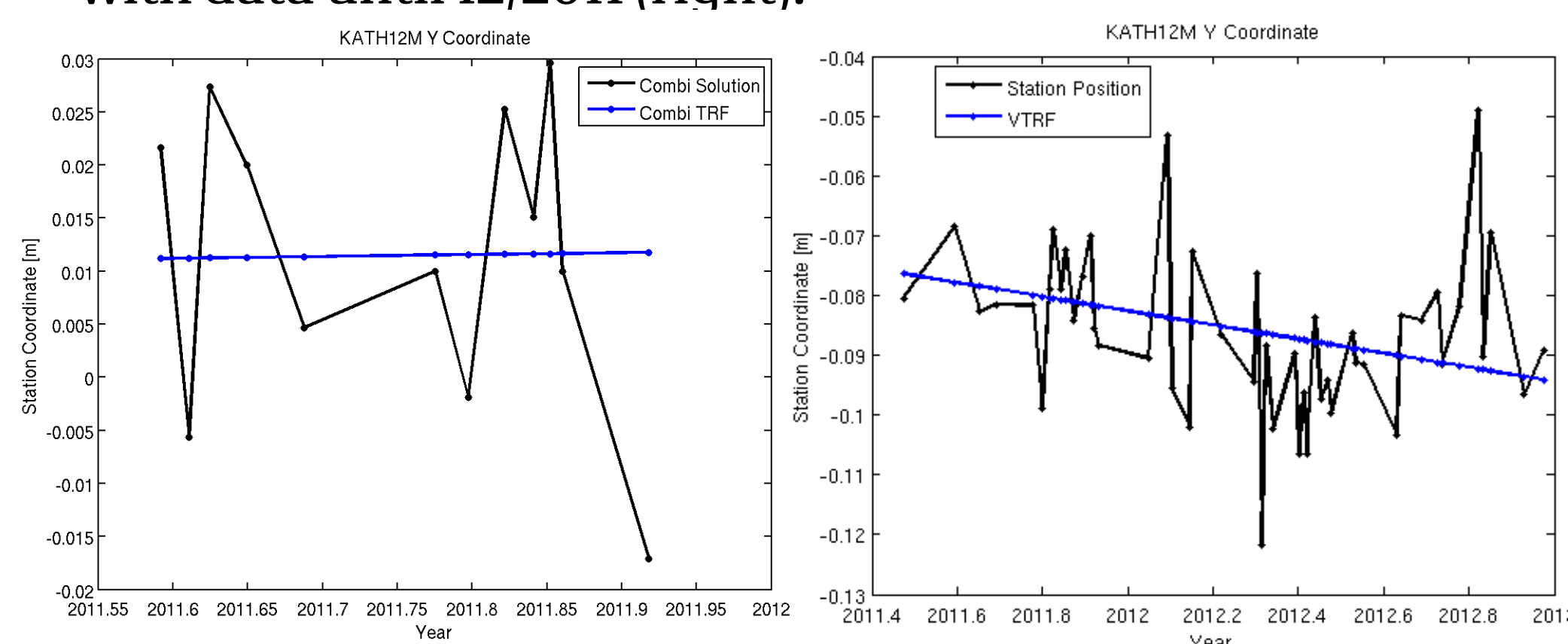


Fig. 1: KATH12M Y-component comparison: observations until 12/2011 (left) and 12/2012 (right).

Annual Variation

Station positions are used for further investigations of the combination solution. In order to identify outlier sessions, the robust session-wise outlier test has been extended to a global outlier test which comprises every combined session.

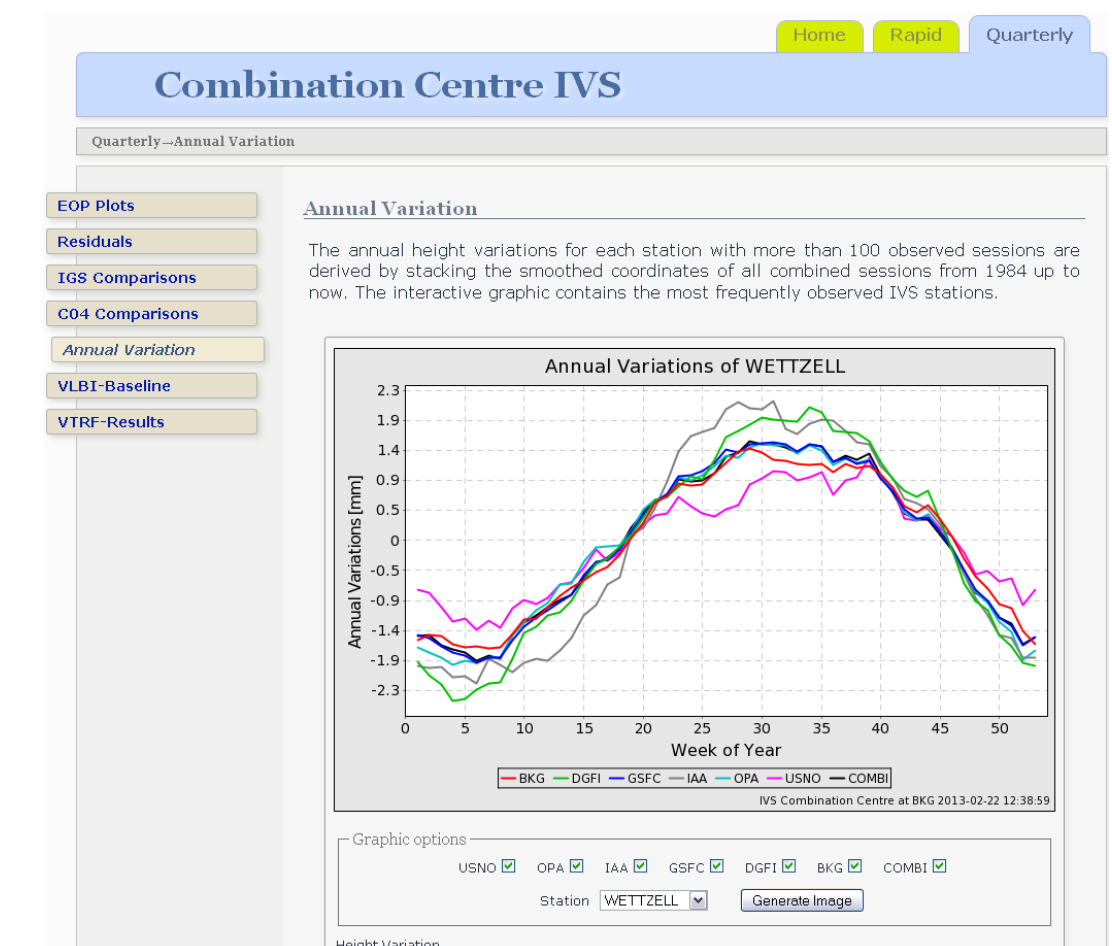


Fig. 2: Screenshot of annual variations.

Figure 2 shows a screenshot of the annual variation of the height component. The station plot uses coordinate data calculated on the basis of the latest VTRF and stored in a database.

Baseline Lengths

Another product which is derived by the station coordinates are baseline lengths. The baselines are generated by a web service which used the station coordinates stored in a database. The user can interactively choose the station and the type of solution (individual or combined), as well as the time span and a scale for a zooming function. Figure 3 shows a screenshot of a baseline length.

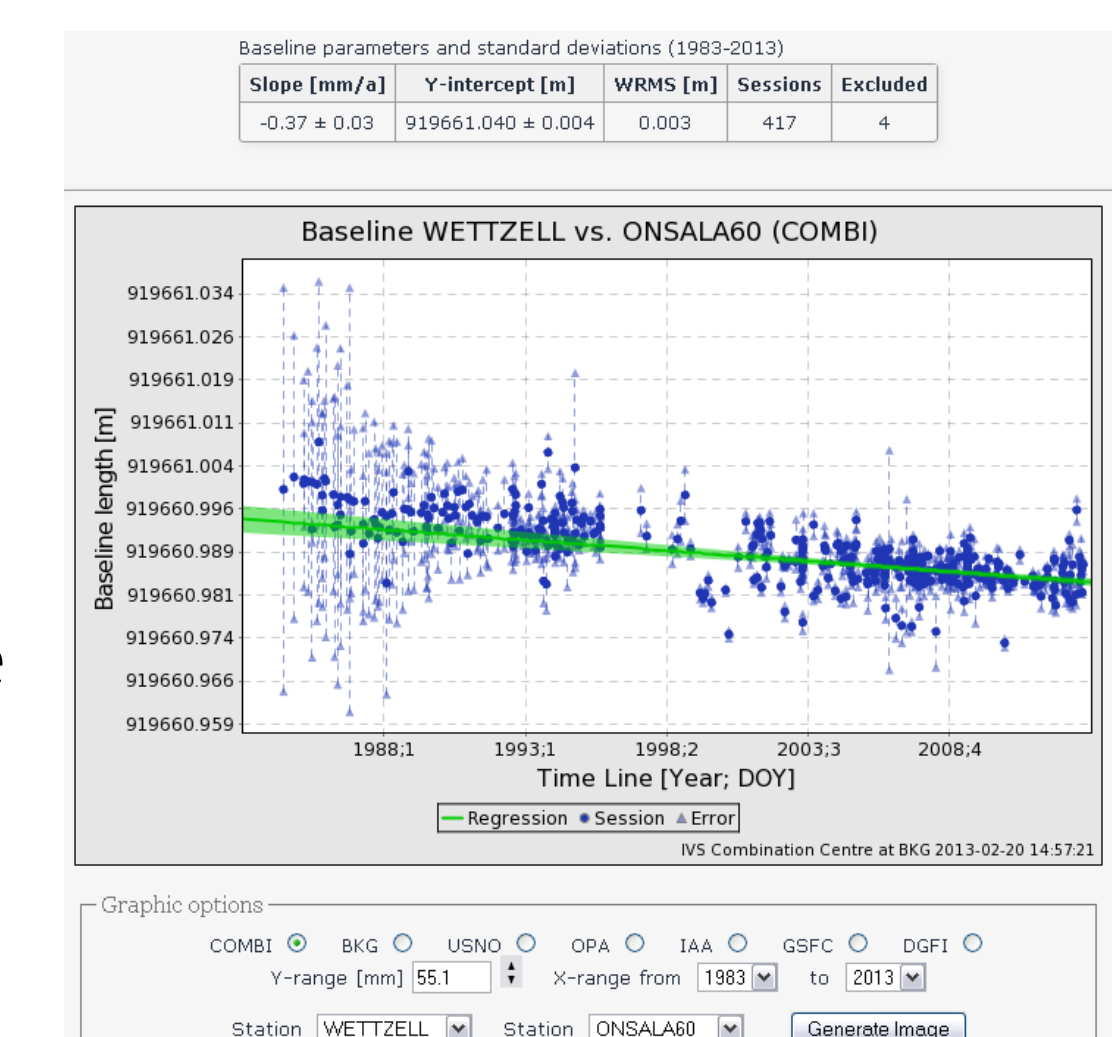


Fig. 3: Screenshot of baseline length.

Source positions

First steps have been taken to generate a combined solution of source positions. Currently, 5 ACs out of 6 are providing source positions in the Sinex files. These additional information has not been used so far. The combination of the two source parameters (right ascension and declination) has been implemented: format problems have been solved and first source position have been successfully combined. Results will be published on the Combination Centres website.

Future Plans

Upcoming activities will be the combination of source positions including the definition of a product and the adequate presentation of the results on the website.

¹http://ivs.bkg.bund.de/pub/vlbi/ivsproducts/daily_sinex

²<http://ivs.bkg.bund.de/pub/vlbi/ivsproducts/eops>

³<http://ccivs.bkg.bund.de/quarterly/vtrf>

Further information

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