

ESOC IGS Reprocessing

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Early in 2008 ESOC has replaced its old GNSS analysis software with its new software, called Napeos. One of the key design criteria of this new ESOC GNSS analysis software has been short processing times! The now fully operation software allows to generate an IGS final solution using 100 stations within 30 minutes on a Linux PC with the Intel Fortran compiler. A network of 150 stations takes around 60 minutes to process. On a “quad-core” CPU four jobs can be run simultaneously without any performance loss. Thus on a single quad-core PC we are able to process 96 days (24 hours x 4 Cores) of IGS data per day! With such a performance rapid reprocessing decades of IGS data becomes feasible. On a single PC reprocessing a full year of IGS data takes less then 4 days. So reprocessing 10 years of data will take about 40 days on a single PC and even less when using multiple PC nodes.

This opens up a great potential for scientific research. New models can be incorporated into the software, tested, and validated. After that an N-year reprocessing can be started to study the effect of the new model and compare to previous reprocessed results. The scientific value of such and efficient tool is tremendous!

In this presentation we will show some selected results from our first reprocessing effort using the year 2007. We have reprocessed this year twice to study the effect of the Earth albedo and infra-red radiation model in our software. The reprocessed results are also compared to the original IGS products for 2007. Using the obtained orbit, clock, and ERP products we will look at internal and external consistencies of the results. We also look at a “fast Fourier transformation” (FFT) of the obtained time series and will show some interesting results. Last but not least we will use the SLR observations of the two GPS satellites carrying SLR reflectors to study the quality of the different IGS orbits.

Since the results are too much for the (short) presentation we will also generate a poster which will contain additional results.