NAPEOS: The ESA/ESOC tool for Space Geodesy

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Over the last years ESOC has put significant effort into enhancing its NAPEOS software to make it multi-technique capable. As a result NAPEOS is now capable of fully combined processing of SLR, DORIS, GPS, GLONASS, and GALILEO (GIOVE) observations. At ESOC NAPEOS is used for a large number of different operational tasks. Most relevant is the fact that a single version of NAPEOS is used for routinely generating the ESOC analysis centre products for the IGS, ILRS, and IDS. Here it should be pointed out that ESOC is a full analysis centre in all these three space geodetic technique services.

The NAPEOS multi-technique capabilities allow combining the observations from the different techniques on the observation level. One obvious major benefit of this is that it ensures that identical models are used for all techniques and thus all tracking data is processed homogeneously. A second major benefit is that the combination on the observation level offers the unique possibility to tie the techniques not only through the terrestrial local site ties, at collocated sites, but also through their "space ties", i.e. the ties at the satellite. Recent enhancements and efficiency improvements of the NAPEOS software have now even made it possible to include LEO satellites equipped with a GNSS receiver in a full IGS final run, i.e. a GNSS solution using 150 GNSS stations and all (>50) GNSS satellites; a rather unique capability.

The multi-technique capabilities make NAPEOS an excellent tool for Space Geodesy in general and GGOS in particular. Especially the combination of the three space geodetic techniques on the observation level, including LEO satellites that have observations from all three techniques like JASON-1 and -2, does offer an enormous strengthening of the ties between the different observation techniques. At ESOC we have only just begun to uncover the full potential of such a combined data analysis!

Our presentation will focus on the most interesting results obtained with our NAPEOS software from the individual techniques and the multi-technique combination on the observation level.