



Identifying technique systematics by multi-technique combination at observation level

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The accuracy of the International Terrestrial Reference Frame (ITRF) is limited by the accuracy of the individual techniques contributing to it. Thus identifying technique specific systematics is a crucial step to mitigate technique specific errors and to improve the ITRF solution.

The Navigation Support Office (HSO-GN) at ESOC has the capabilities to do a multi-technique combination at the observation level using its software package NAPEOS. We include all satellite geodetic techniques (SLR, DORIS and GPS/GLONASS) in one solution. This allows us to combine the ILRS, IDS and IGS reference frames by using “space-ties”. Of course these space-ties are not perfectly known but nevertheless they allow for a rigorous combination of the different reference frames. The combined processing at the observation level allows to directly estimate inter-technique biases, as space-ties. Comparing the combined solution to the individual technique dependent solutions will help to identify technique dependent effects.

In our presentation will give an overview of this multi-technique combination approach at observation level. We processed data of the entire year 2011. We included all observation provided by GPS and GLONASS but also LEO satellites (like e.g. Jason-2, SPOT, Cryosat, LAGEOS, Etalon) in one and the same parameter estimation process. We solve not only for integer ambiguities of the GPS satellites but also for those of the Jason-2 satellite, which is also providing GPS phase observations on two frequencies. We will show the benefits of such a rigorous approach and discuss the technique-specific systematics and its impact on the combination.