



Scheduling of VLBI satellite observations for an improved ITRF

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Observations of Earth orbiting satellites with the Very Long Baseline Interferometry (VLBI) technique provide a variety of new possibilities and promote the integration of different geodetic techniques, which is one of the main purposes of GGOS, the Global Geodetic Observing System of the IAG. Promising applications can be found e.g. in the field of inter-technique frame ties, having the potential to improve future realizations of the International Terrestrial Reference Frame (ITRF). Although several test observations to GNSS satellites have been carried out in recent years, this approach is still far away from being applied operationally. Difficulties already start at the observation planning level, with the standard VLBI scheduling software not being prepared to include satellites as observation targets in the required control files.

The newly developed satellite scheduling module of the Vienna VLBI Software (VieVS) for the planning of satellite observations with VLBI antennas offers a solution to this. It allows the user to prepare schedules for selected satellites, which are simultaneously visible from a chosen station network. The generated schedule files in the current VEX format provide the possibility to carry out actual satellite observations with standard geodetic antennas, e.g. of the IVS network. The antennas can be controlled directly with the issued schedule files by commanding sequences of discrete celestial positions, without the requirement of modifications in the antenna control intended for satellite tracking.

In January 2014 several successful test observations to GLONASS satellites were carried out on the baseline Onsala-Wettzell based on schedules generated with VieVS. Correlations of the recorded data showed that the observations – and therefore the scheduling with VieVS – were successful. The next step is to update the new software for the possibility to combine observations to satellites and to quasars in one schedule. The development of convenient scheduling software in the form of the new VieVS module is important to promote further research and development in this specific field.