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Simulations of near real-time EOP estimation from a future VGOS network

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The VLBI Global Observing System (VGOS) will present a number of challenges for VLBI data analysis. For example, there will be an increase in the number of observations per day by a factor of 10-30 or even more. Furthermore, another goal of VGOS is to reduce the latency between observation and availability of the results, like the Earth Orientation Parameters (EOP) to less than one day. Ideally, the results should be available in near real-time. Thus, every part of the VLBI processing chain, e.g. observation, data transfer, correlation, and data analysis, needs to be able to operate autonomously in real-time.

To meet the challenges that VGOS will put on the data analysis part, we have implemented a Kalman filter module in our software, VieVS@GFZ, which is able to analyze VLBI data fully automated in near real-time. In this contribution, we present this module, in particular the setup for real-time analysis, and we test its performance through simulation of a real-time estimation scenario from a potential future 30 station VGOS network. We focus on the precision obtained for the EOP, which is the most interesting VLBI product in terms of near real-time availability. Furthermore, we study how well the Kalman filter is able to autonomously cope with potential problems in the VLBI data, such as clock breaks.

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