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Real Time GPS- Satellite- and Receiver Clock Estimation – An interactive RTIGS Web Service

V. Broederbauer (1), M. Caissy (2), **M. Opitz** (1), R. Weber (1)

(1) Technical University of Vienna, Austria, (2) National Resources, Canada
(mopitz@mars.hg.tuwien.ac.at)

Since 4 years the IGS (International GNSS Service) Real-Time Working Group disseminates via Internet raw observation data of a subset of stations of the IGS network. This observation data can be used to establish a real-time integrity monitoring of the IGS predicted orbits (Ultra Rapid (IGU-) Orbits) and clocks, according to the recommendations of the IGS Workshop 2004 in Bern.

The Institute for "Geodesy and Geophysics" of the TU-Vienna develops in cooperation with the IGS Real-Time Working Group the software "RTR- Control", which currently provides a real-time integrity monitoring of predicted IGU Satellite Clock Corrections to GPS Time. Besides RTR-Control estimates the Receiver Clock Corrections of the permanent stations in the global network and allows for the comparison of pseudoranges measured at these stations with “theoretical pseudoranges” calculated on basis of the IGU- orbits. Thus, the programme can diagnose incorrectly predicted satellite orbits and clocks as well as detect multi-path distorted measurements in real-time. This presentation shows the results of a prototype version of “RTR- Control” which is in operation since August last year.

RTR- Control calculates every 15 seconds Satellite- and Receiver Clock Corrections with respect to the most recent IGU- clocks (updated in a 6 hours interval). The clock estimations are referenced to a stable station clock (H-maser) with a small offset to GPS- time. This real-time Satellite Clocks are corrected for individual outliers and modelling errors. The most recent GPS- Satellite Clock Corrections (updated every 60 seconds) are published in Real Time via the Internet. All other results (station clocks, pseudorange residuals, comparison, etc.) can also be obtained from the webpage.

The user group interested in a rigorous integrity monitoring comprises on the one hand

the components of IGS itself to qualify the issued orbital data and on the other hand all users of the IGS Ultra Rapid Products (e.g. for PPP in Real Time).