Evaluating orbits from the EGSIEM reprocessing

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In the frame of the EGISEM (European Gravity Service for Improved Emergency Management)-project a full reprocessing of the GPS- and GLONASS-data back to 1994 has been carried out at AIUB. Clock corrections are available with 30 seconds sampling – and later even with 5 second sampling for GPS and GLONASS satellites as far as it was possible to derive complete datasets with the available tracking data. The results are meanwhile published at ftp://ftp.aiub.unibe.ch/REPRO_2015.

The obtained GPS and GLONASS orbits have been evaluated with respect to different aspects. One aspect was the stochastic component of the orbit model currently used at the CODE analysis center of the International GNSS Service. The stochastic orbit parameters are improving the orbit solution in particular when the satellite is in its eclipse season. A refinement of the scheduling of stochastic parameters can help to further improve the orbit solutions, in particular for GPS satellites.

Another result of the evaluation of the orbits is that there are periods before the year 2010 where dedicated GPS satellites show an exceptional behavior that is not sufficiently handled by the usual orbit model. Examples are shown and discussed.