Geophysical Research Abstracts, Vol. 8, 01848, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01848
© European Geosciences Union 2006

Automated Prediction and Investigation of Statistical Properties of GPS Clock Corrections

V. Broederbauer, R. Weber

Institute of Geodesy and Geophysics, TU Vienna, Austria (veronika@mars.hg.tuwien.ac.at)

The accurate and reliable prediction of satellite clocks and orbits is an indispensable condition of all GNSS based positioning applications in real time. While the orbits are output to an integration of the well-known force field the clock corrections to GPS Time have to be extrapolated by means of an experienced prediction model.

A new model for predicting GPS and GLONASS satellite clocks has been developed at the Institute of Geodesy and Geophysics at the TU Vienna. For the extrapolation of GPS satellite clocks we use the observed part of the IGS Ultra Rapid solutions, which are provided by the IGS (International GPS Service) since November 2000. A history of 48 hours is used as input data to a least squares adjustment to determine satellite specific coefficients of a polynomial of second order. Moreover, depending on the clock behaviour (caesium or rubidium), cyclic terms are added to predict the satellite clock values over the upcoming 12 up to 24 hours. A special problem to account for is the clock jump at the boundary of consecutive IGU solutions. This presentation will introduce the applied prediction models. In addition we present some statistical studies using the Allan variance to investigate the noise-character of the residues with respect to the observed IGS Rapid solutions. We also show comparisons of the GNSS-VC predictions to the IGS Broadcast clocks.

From May 2006 onwards GNSS-VC will operate fully automated to deliver every 6 hours (dependent on the availability of the IGS Ultra Rapid solutions 4 times a day (02:00, 08:00, 14:00, and 20:00 UT)) GPS clock corrections for the upcoming 9 hours (with a short overlapping interval). The clock predictions will be available at the institutes Web-Page.