GLONASS Time Template Update

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GLONASS Time Forming

GLONASS Time is a “paper” time scale formed on the basis of Central Synchronizers (CS).

There are 2 CSs: the Main CS and the Reserve CS. The time scale of the Reserve CS is referenced to the time scale of the Main CS.

Each CS contains 4 Hydrogen Masers.

CS accuracy parameter:

– daily frequency instability – below $2 \cdot 10^{-15}$.

GLONASS Time Synchronization to UTC(SU)

GLONASS Time is Referenced to Russian National Time UTC(SU) generated by State Time and Frequency Reference Standard (STFR)

There is no whole second GLONASS Time – UTC(SU) offset as CS time is corrected by ±1 s simultaneously with UTC leap second corrections.

GLONASS Time-UTC(SU) offset (modulo 1s) is specified below 1 ms.

There is constant 3-hour GLONASS Time – UTC(SU) offset due to GLONASS operational principles.

Corrections to Convert from Satellite to GLONASS Time

FDMA signals in L1/L2 bands:

-corrections: $\tau_n(t_b)$ $\gamma_n(t_b)$ linear parameters;

-equation to convert: 

CDMA signals in L1/L3 bands:

-corrections: $\tau^j(t_b)$ $\gamma^j(t_b)$ $\beta^j(t_b)$ **second order model parameters;**

-equation to convert: 

Corrections to Convert from GLONASS Time to UTC(SU)

FDMA signals in L1/L2 bands:

-correction: τ_c - constant;

-equation to convert: 

CDMA signals in L1/L3 bands:

-corrections: $\tau_c(t_b)$ $\dot{\tau}_c(t_b)$ **- linear parameters;**

-equation to convert: 

GNSS-GNSS Time Offset Corrections

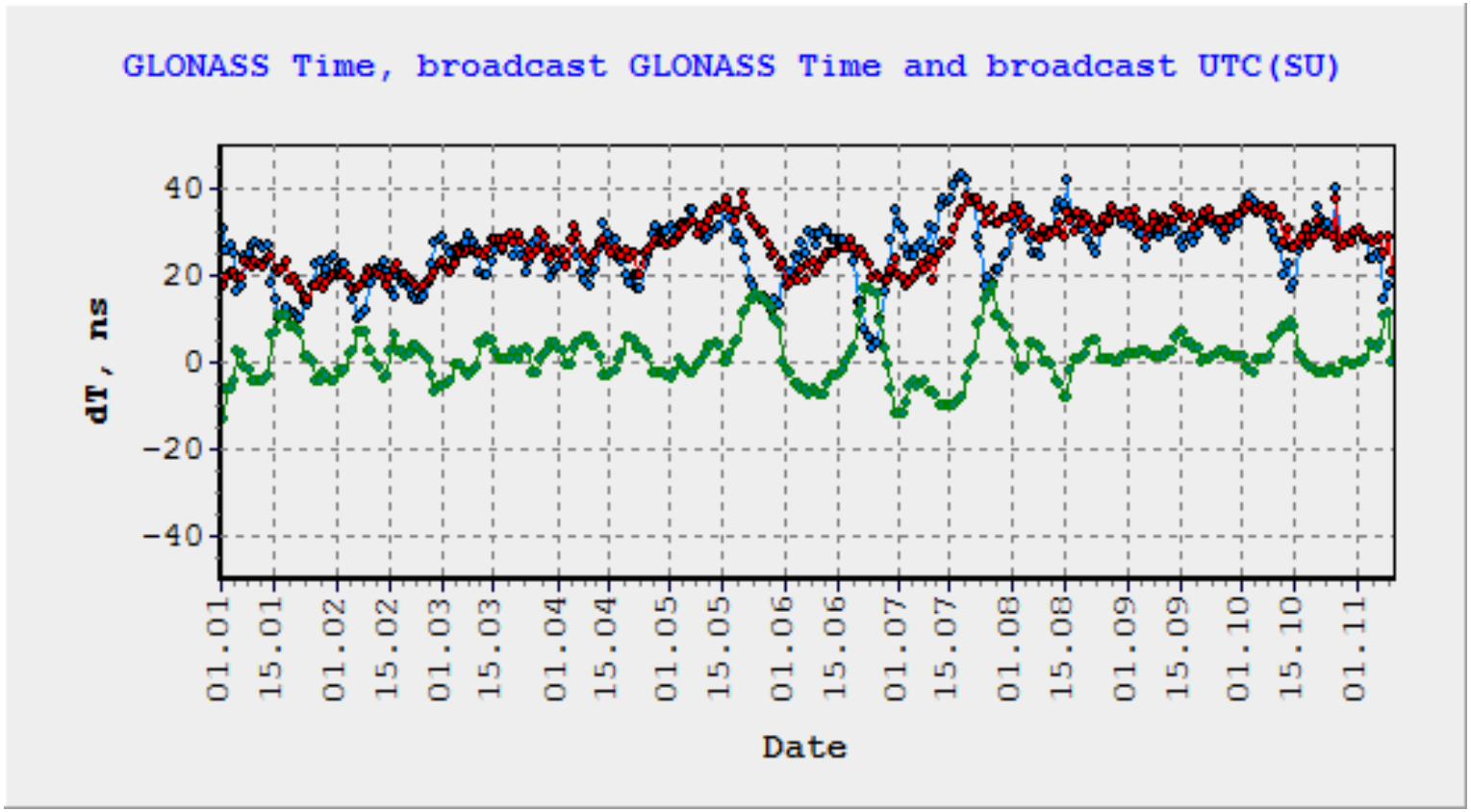
FDMA signals in L1/L2 bands and CDMA signals in L1/L3 bands

-correction: τ_{GPS} - constant;

-equation to convert: 

τ_{GPS} - is the fractional part of GPS – GLONASS Time offset, the integer part Δ T is determined by user from GPS navigation message.

GLONASS Time (green), broadcast GLONASS Time (red) and broadcast UTC(SU) (blue) in 2017



Thank you for your attention!