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GLONASS provides solutions for following functional tasks:

- generation of the system time (ST) and keeping it within specified limits relative to the reference time scale;
- mutual synchronization of space vehicle (SV) times by means of generating corrections for the SV time offset of each SV relative to ST;
- generation of corrections for GLONASS ST offset relative to a reference time scale;
- generation of corrections for the offset between GLONASS ST and GPS ST.

The national coordinated time scale of Russia UTC(SU), formed by the State Time and Frequency Reference (STFR), uses as a reference time scale for GLONASS.

GENERATION OF THE GLONASS SYSTEM TIME

GLONASS ST is being generated as a continuous time scale based on the time of the Central Synchronizer (CS).

When correcting UTC(SU) by a plus or a minus 1 second, the corresponding CS time correction is being performed.

THE DETERMINATION OF CS TIME OFFSET RELATIVE TO STFR TIME

The determination of CS time offset relative STFR time is being realized on the base of joint processing the results of simultaneous measurements the offsets of CS time and STFR time relative to GLONASS ST and GPS ST.

Error of determining CST/STFR offset is no more than 5 ns.

GENERATION OF CORRECTIONS FOR THE OFFSET BETWEEN GLONASS ST AND GPS ST

For generating and subsequent uploading to the SVs the data on the offset between GLONASS ST and GPS ST, following actions are being supported:

- determination of the CS time offset relative to GLONASS ST and GPS ST and transformation of results obtained to the values of the offset between GLONASS ST and GPS ST;
- joint processing the session values of the offset between GLONASS ST and GPS ST over some observation interval for estimating the parameters of the offset between GLONASS ST and GPS ST and its subsequent prediction over a spesified time interval;
- generation of corrections for the offset between GLONASS ST and GPS ST.

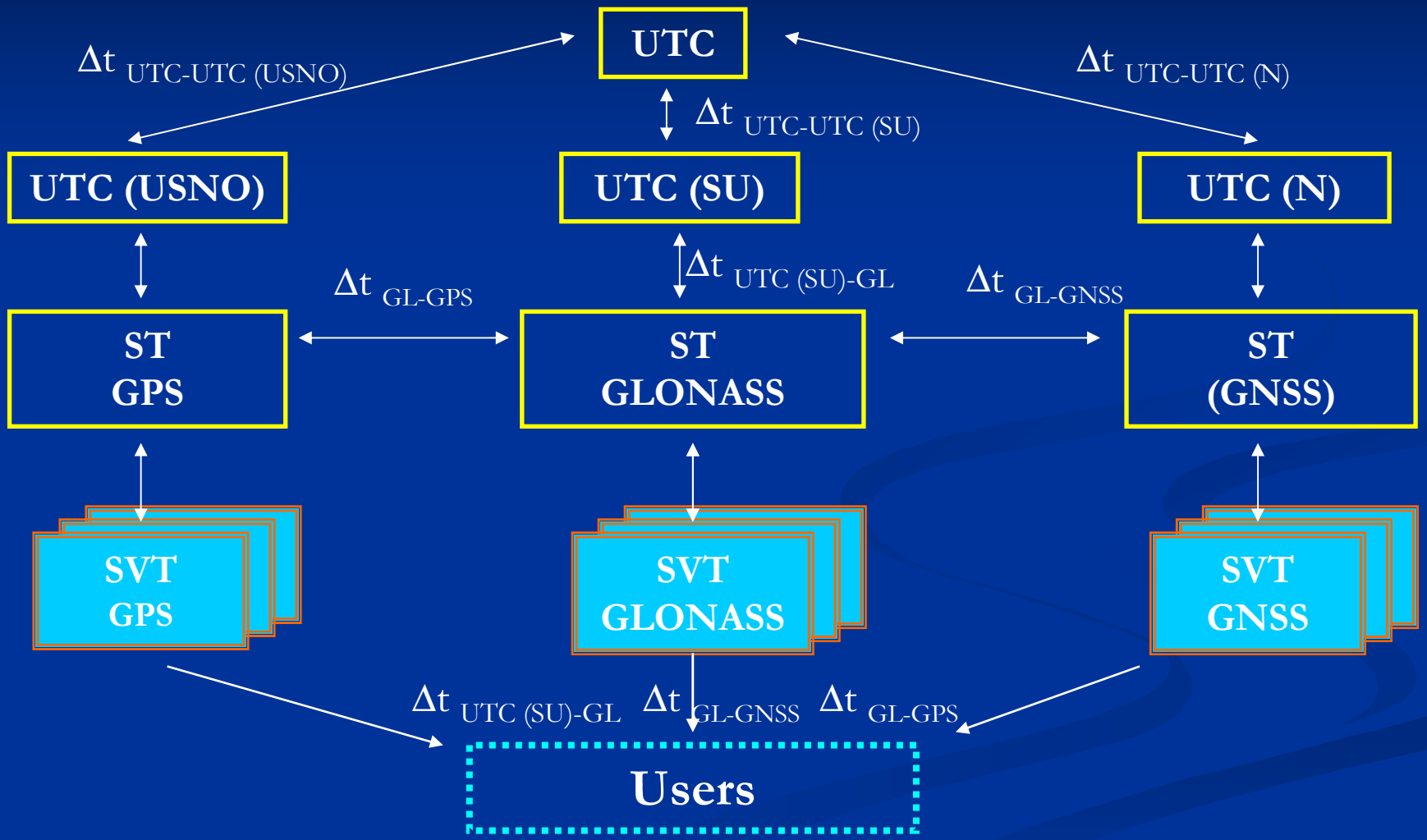
Error of determining GLONASS Time/GPS Time is no more than 20 ns.

Mutual time scales synchronization (present time)

In each of existing or being created GNSS (GPS, GLONASS, a.o.), the mutual synchronization of space vehicles' (SVs) times is supported as follows:

1. The own system time (ST) is generated.
2. ST is locked (synchronized) to national coordinated time UTC(N).
3. SV time are locked (synchronized) to ST using frequency /timing corrections (FTC).
4. FTSs are uploaded to each SV and transmitted within each navigation message.

Mutual time scales synchronization (present time)



Mutual time scales synchronization (future)