



RUSSIAN LASER TRACKING NETWORK

***V. Burmistrov, A. Fedotov, N. Parkhomenko,
V. Pasinkov, V. Shargorodsky, V. Vasiliev***

***Institute for Precision Instruments Engineering
Moscow, Russia***

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RUSSIAN LASER TRACKING NETWORK

Russian SLR stations comprise three optical channels: ranging channel, angular measurement channel, and photometric channel, providing the following accuracy:

- Ranging: 5 - 10 mm (RMS of NP)
- Angular measurements (in reflected sunlight):
1 arcsec
- Photometry (in reflected sunlight): ≈ 0.2 star magnitude



Ranging data application

T High precision of laser ranging allows to use SLR as an only source of calibration data for GLONASS ephemeris determination providing solution of following problems:

- Estimation of accuracy and calibration of radio-frequency means for GLONASS orbit measurements
- Monitoring of on-board clocks and application of the data for operational control of GLONASS time and ephemeris data by means of providing SLR stations with geodetic-class RF navigation receivers connected to hydrogen maser frequency standards
- Providing of the geodetic base for GLONASS reference frame
- Providing of declared values of the ephemeris precision as well as computation and forwarding of accuracy factor in the navigation frame of GLONASS – M spacecraft



Angular measurements data application

Angular measurements data obtained on SLR stations are used for implementation of single-point scheme of flight control for commercial geostationary spacecraft by means of periodical measurements of orbit inclination to provide retaining of the spacecraft standpoint within ± 0.1 deg. in longitude and ± 0.1 deg. in latitude

Photometric data application

- Presence of a high-sensitivity TV channel provides registration of flight phases (rocket engines turn-on, booster separation, etc.) during launching of spacecraft on high elliptical and geostationary orbits
- The photometric channel supports the determination of spacecraft motion relatively to its center-of-mass and its attitude stability as well



Taking into account the unfavorable astro-climatic conditions on most of the country territory efforts are made to expand the Russian laser tracking network. Currently 5 SLR stations are in operation. In next 3 - 5 years the number of stations will be increased up to 15...20 as it is declared in the new Global Navigation System Federal program.

Russian laser tracking network:



1. Schelkovo (Moscow suburb)



2. Altai

Russian laser tracking network:



3. Komsomolsk



4. Archyz (Northern Caucasus)

Russian laser tracking network:



5. Baikonour (Kazachstan)



6. Maidanak

Russian laser tracking network

