

The results of full-scale tests of the new Russian laser station «Tochka»

Sergey Martynov¹, Mikhail Baryshnikov¹, Igor Blinov², Nikolay Bondarev¹, Boris Borisov¹, Sergey Donchenko², Aleksey Kolychev¹, Yuri Nekrasov¹, Mikhail Sadovnikov¹, Viktor Shargorodskiy¹

¹RPC PSI, , Russian Federation, ²VNIIFTRI, , Russian Federation

The new Russian station «Tochka» was installed at the operation site «Mendeleevo» in late 2017 and successfully passed the initial full-scale tests over the first half of 2018.

The paper presents the specifics of the station deployment inside a technical building and the results of the conducted full-scale tests.

The paper presents experimental features of the laser station's automatic pointing at the spacecraft equipped with onboard retroreflectors under both night and daytime conditions.

The paper presents experimental output performance rates of the laser station depending on the elevation and weather conditions.

The paper presents experimental data on the achieved accuracy of calibration range measurements in single-electron laser pulse reception mode (≤ 1 mm).

The paper presents experimental data on the accuracy of ranging to various spacecraft under both night and daytime conditions when the data collection interval duration is 60 seconds (0.3 mm on the SC «Glonass», 0.2 mm on the SC «Lageos»).

The paper also presents experimental data on the accuracy of linking a laser pulse to an external time scale for precision time transfer mode (≈ 50 ps).