

## Ukrainian SLR network

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### Abstract

*The structure of Ukrainian SLR network is described in the article. Technical description and current activities for each of the station are presented. Perspectives and plans for future of the Ukrainian SLR network are outlined.*

### Current Status

The Ukrainian SLR network was created by several organizations and includes four permanent SLR stations: Golosiiv-Kiev, Simeiz, Katzively, and Lviv (Bolotina, 2007). The permanent SLR stations Uzhgorod, Dunaivtsi, Alchevsk, and Evpatoria operate in an experimental mode.

The satellite laser ranging station Golosiiv-Kiev of the Main Astronomical Observatory of the National Academy of Sciences of Ukraine (MAO NASU) was founded in 1985. The third-generation equipment of the station was mounted in 1985. Due to some reasons the station was not in operation up to 1996. The experimental ranging of satellites started on 1 April 1997. The routine ranging of night passes has been carried out since January 2000, and its results have been sent to the Eurolas Data Center (EDC) at DGFI/ILRS Global Data Center. The SLR station Golosiiv-Kiev was included in the International Laser Ranging Service (ILRS) in 2000. The satellite laser ranging station Golosiiv-Kiev was added to the list of the National objects of Ukraine.

The satellite laser ranging station Lviv of the Astronomical Observatory of the Ivan Franko National University of Lviv was founded in 1987. The third-generation equipment of the station was mounted during 1997-1998. The experimental ranging of satellites were started on 23 December 1998. The routine ranging of night passes are being carried out since 1 January 1999, and since 2002 the results are being sent to the Eurolas Data Center (EDC) at DGFI/ILRS Global Data Center. The SLR station Lviv was included in the International Laser Ranging Service (ILRS) in 2002.

The satellite laser ranging station Simeiz was founded in 1988 by the Crimean Astrophysical Observatory, Crimea, Ukraine. In 1991 the station was certificated by European Space Agency using mobil SLR station from Munich. The third-generation equipment of the station was mounted. Experimental night passes started in 1988. The routine ranging of night passes of satellites (all low at the station. The SLR station Simeiz was included in the International Laser Ranging Service (ILRS).

The satellite laser ranging station Katzively was founded in 1984 on the basis of the Crimean Scientific Station of the FIAN. The second-generation equipment of the station was mounted in 1984. The third-generation equipment of the station was mounted in 1990. The experimental ranging of the satellites LAGEOS started in 1984. The routine ranging of night passes has been carried out since 1988, and the results have been sent to the Eurolas Data

Center (EDC) at DGFI/ILRS Global Data Center. Since 1992 the SLR station Katzively becomes a laboratory of the Crimean Laser Observatory (CLO) of the FIAN. Since 2000 the satellite laser ranging station Katzively, as well as the CLO, become a department of the Main Astronomical Observatory of the National Academy of Sciences of Ukraine (MAO NASU). The SLR station Katzively was included in the International Laser Ranging Service (ILRS) in 2000.

Ukrainian stations Simeiz and Katzively are observed regularly. Since 2007 discontinues in data sets of these stations do not exceed 14 days. Several exceptions took place during 2007-2008 when upgrade of equipment on stations were made. SLR stations Golosiiv-Kiev and Lviv are operating unregularly.

Seasonal and monthly variations of a number of observations take place in data sets of all ukrainian SLR stations. Since 2005 number of observations are increase for ukrainian SLR station Golosiiv-Kiev, Simeiz and Katzively.

Ukrainian SLR stations Golosiiv-Kiev, Lviv, Simeiz do not correspond to the ILRS station qualification criteria (data quantity) for Low Earth Satellite Passes. Since 2007 SLR station Katzively fulfills qualification criteria for Low Earth Satellite Passes. Ukrainian SLR stations do not fulfill qualification criteria for LAGEOS 1 & LAGEOS 2 Passes. After modernization two ukrainian SLR stations, Simeiz and Katzively, can locate of High Satellites. Since 2008 ukrainian SLR station Katzively corresponds to the ILRS station qualification criteria for High Satellite Passes.

### **Plans for Future**

Ukrainian SLR stations Simeiz and Katzively will fulfill qualification criteria (data quantity) for Low Earth Satellite, LAGEOS 1 & LAGEOS 2, High Satellite Passes already in 2009-2010.

Ukrainian SLR stations Golosiiv-Kiev and Lviv will correspond to qualification criteria (data quantity) for Low Earth Satellite, LAGEOS 1 & LAGEOS 2 to 2011-2012.

All ukrainian SLR stations will fulfill qualification criteria (data quality) to 2010.

Daily location of Low Earth Satellite will be realised by all ukrainian SLR station to 2010.

### **References**

Bolotina O., Medvedskij M., *Some results of investigation of the stability of the Ukrainian SLR stations*, Kinematics and Physics of Celestial Bodies, 2007, Vol. 23, No 1, p.11-17.