

BOOK OF ABSTRACTS



Actual Questions of Ground-based Observational Astronomy

MAO-200

September 27-30, 2021, Mykolaiv, Ukraine

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
RESEARCH INSTITUTE “MYKOLAIV ASTRONOMICAL OBSERVATORY”

**ACTUAL QUESTIONS OF GROUND-BASED
OBSERVATIONAL ASTRONOMY**

International Conference

ABSTRACT BOOK

September 27-30, 2021,
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The Book of Abstracts contains abstracts of presentations to the International Conference “Actual Questions of Ground-based Observational Astronomy” to be held in Mykolaiv, Ukraine, on September 27-30, 2021. Methods and technical means of ground-based observations, a role of the International Virtual Observatory Alliance (IVOA) in modern research and actual problems of ground-based astronomy are presented.

PECULIARITIES OF OBSERVATIONS OF SATELLITES ON HIGH ECCENTRICITY ORBITS

***M. Kulichenko¹, Ye. Kozyryev¹, V. Kriuchkovskiy¹, N. Maigurova¹,
C. Phillips², O. Shulga¹***

*¹ Research Institute “Mykolaiv astronomical observatory”,
Mykolaiv, Ukraine,*

*² Spaceflight Research, LLC, Houston, Texas, USA
niiko4kulichenko@gmail.com*

Molniya-like orbits are typical highly elliptical orbit (HEO) orbit with inclination of about 65°, high eccentricity of about 0.7 and periods of one-half day. Most of the satellites on the HEO orbits are old rocket bodies and other space debris. Objects on as highly elliptical orbit are very danger for LEO satellites and for people in case of a fall because of increasing velocity near the perigee. The situation is complicated by the fact that the NORAD catalog does not contain the orbital elements for many of these objects.

This report is dedicated to observation of space debris on Molniya-like orbits with purpose of their reentry prediction. 8 Molniya-like satellites were successfully observed at RI MAO during May-September 2021. The orbital elements for some of these objects are not presented in NORAD catalog. The estimates of the accuracy of the obtained positional observations are given. The mean square errors of position were $\pm(1.0-3.0)''$ in right ascension and declination for the objects in (8–11)^{mag} range. Orbital elements of these satellites were calculated using FindOrb software and software developed in Astronomical observatory of Odessa National University. Orbital elements in TLE format were represented on Ukrainian Optical Station Network (UMOS) website.