

Slovakia, Item 7

60th Session of the Scientific and Technical Subcommittee (February 6 – 17, 2023)

Agenda Item 7: Space Debris

Mr. Chair, Distinguished Delegates,

Since my delegation takes the floor for the first time at this session, allow me to thank you, Mr. Chair, and thank UNOOSA Director Mr. Niklas Hedman and his staff for the work they have done and their excellent preparations for this session.

Allow me to present you the recent accomplishment of the Slovak Republic, in its national capacity, to the work related to Agenda Item 7: Space debris. The focus of space debris research in Slovakia is dedicated to measurement acquisition with optical telescopes to support the space debris cataloguing, and its physical characterization, and to monitor and model so-called re-entry events.

The Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava, Slovakia (FMPI CU) continues with regular observations of space debris with its optical passive telescope equipped with the 70cm parabolic mirror. This telescope is used for observations of space debris objects situated in low-earth orbit regimes, through geosynchronous orbits up to the cis-lunar region to improve the information about objects' dynamical and physical properties for space safety applications. Observations are conducted in the framework of activities of the European Space Agency (ESA) and with collaboration with the private sector, as well with partners from abroad such as the Astronomical Institute of the University of Bern in Switzerland. Acquired data are used to identify the objects' reflectance properties such as size and shape. The Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava, Slovakia is investigating the application of machine learning methods to distinguish objects according to their brightness properties, a method which allows the classification of space objects' shape and surface reflectance properties. By using different spectral type photometric filters, The Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava, Slovakia is investigating surface reflectance properties of space objects as a function of wavelength which is directly related to the material properties.

Additionally, in October 2020 the global all-sky meteor network AMOS operated by Comenius University Bratislava observed a Long March 3 rocket's third upper stage which disintegrated over the Hawaii islands. This re-entry event was detected from two different locations simultaneously. Comenius University is now adapting its internal tools dedicated to the data reduction of meteor events to process the acquired video recordings and to create a high-quality and unique data set for 3D modelling of the whole fragmentation process. This is performed within the framework of European Space Agency activity. The to-be-developed procedure will be used for future re-entry events predictions and on-ground risk assessment. Thanks to sixteen stations deployed around the

world on four different continents, it is expected that the AMOS network will be detecting re-entry events on monthly basis in the close future.

Additionally, the Slovak delegation would like to inform you of its support of the Conference Room Paper on the Protection of Dark and Quiet Skies for science and society (A/AC.105/C.1/2023/CRP.18; submitted by Chile, Spain, Slovakia, Bulgaria, International Astronomical Union, European Astronomical Research in the Southern Hemisphere and Square Kilometre Array Observatory. Slovakia is co-sponsoring the presented CRP and will deliver a separate speech on this matter under Agenda Item 17. General exchange of views on dark and quiet skies for science and society.

Mr. Chair, distinguished delegates,

Thank you for your attention.