Application of the database of comet polarimetry (DBCP) for study the connection between physical and dynamic characteristics of selected comets

Olena Shubina[1], Oleksandra Ivanova[1,2]

[1] *Main Astronomical Observatory of National Academy of Science of Ukraine, Kyiv, Ukraine*
[2] *Astronomical Institute of the Slovak Academy of Sciences, SK-05960 Tatranská Lomnica, Slovak Republic*

belkalenaastronom@gmail.com

Polarimetry is effective method to determine the physical properties of comets. Comparison data of polarimetric observations with results of theoretical modeling and laboratory measurements follows us to determine the most likely composition, structure, and some other characteristics of comets. However, for this, sufficiently complete phase-angle dependencies of polarization in a wide range of phase angles and wavelengths is need. Unfortunately, it is impossible to get the phase-angle dependence of polarization for a particular comet in a wide range of phase angles. Therefore, one can use the synthetic phase-angle polarization dependence that based on all available observations of different comets. In our study, we used a new version of the database of comet polarimetry (EAR-C-COMPIL/VARGBDET- 4-COMETPOL-V2.0. NASA Planetary Data System, 2017) that covers ranges of phase angles, helio- and geocentric distances 0.0-122.1°, 0.0-0.341-7.01 au and 0.01-6.52 au, respectively. We analyzed the phase-angle dependence of the degree of linear polarization of comets, as a function of wavelength, heliocentric and geocentric distance, dynamic characteristics and other parameters. This approach allows us to get the average polarization characteristics for different groups of comets including short-periodic, Halley-type and dynamically new comets with different places of origin in the Solar system and different evolution.