Contribution ID: **34** Type: **not specified**

Phase and color ratio method for searching areas with an anomalous optical roughness on the Vesta surface (12+3)

Friday 30 April 2021 10:00 (15 minutes)

The last decade has become a significant time for robotic exploration bodies of the solar system. Among such research programmes was The Dawn Mission to asteroid Vesta and dwarf planet Ceres, whose results allow us to carry out a detailed analysis of asteroid (4) Vesta surface properties by using methods that were developed and effectively used in the analysis of the Moon data.

Images of asteroid (4) Vesta obtained by Dawn's framing camera were used in our research. The Framing Camera (FC) has one clear and seven band-pass filters (from 0.44 μm to 0.98 μm), which cover one of the Vesta' s pyroxene absorption band with maximum at 0.9 μm. We received maps of the spatial distribution of color index C(749nm/918nm) and C(749nm/978nm) to determine band depth. Maps of color index C(749nm/428nm) illustrates spectral slope in the visible wavelength range and by maps of C(428nm/978nm) we can obtain general spectral slope. Therefore, phase ratio method is the simplest approach for analyzing phase functions over a surface. In our research, we used two aligned images of the same area in clear filter, but acquired at different phase angles $_1$ and $_2$.The resulting phase ratio image provide a map on which we can find regions with anomalous optical roughness. Comparison of the albedo images and maps of color index and phase ratio allows to identify evidence of slope processes and variations of chemical composition. For image processing and analysis was used ISIS software (The Integrated System for Imagers and Spectrometers).

We built maps of the spatial distribution of color index for three areas: both Numisia and Cornelia craters and area Aricia Tholus. Results of analysis will be presented at the conference meeting.

Author: Ms VALERIYA, Rychagova (Institute of Astronomy Kharkiv National University, Kharkiv, Ukraine)

Co-author: SLYUSAREV , I. G. (Department of Physics of Asteroids and Comets Institute of Astronomy of Kharkiv National Universit)

Presenter: Ms VALERIYA, Rychagova (Institute of Astronomy Kharkiv National University, Kharkiv, Ukraine)

Session Classification: Solar System & Exoplanets