Contribution ID: **14** Type: **Študenti fyzika**

Verification of photometric transformations for small Solar System bodies on Main-Belt asteroid color data

Wednesday, November 26, 2025 11:00 AM (1 minute)

The light reflected from the surface of solid celestial bodies like asteroids contains information about chemical composition, physical and structural properties of their near-surface material. Measurements of this reflected light through different broadband photometric filters enable us to study color properties of minor bodies. Color-color diagrams, constructed from photometric color indices, help to group minor planets into different taxonomic classes, which provide insights on origin, physical and dynamical evolution, and mutual relations of small Solar System bodies.

However, interpretation of the results is complicated because different observers use different combinations of detectors, filters and telescopes, meaning that the colors of observed objects are derived in different photometric systems. The two most popular photometric systems are Johnson-Kron-Cousins and Sloan systems. While older observations of minor planets have been mostly obtained in the Johnson-Kron-Cousins system, most modern professional observatories and surveys utilize the Sloan photometric system. The passbands of these two systems do not match each other, which makes it problematic to calibrate archive and new color data. There are many different transformation equations between these two systems, but most of them were derived for stellar and galactic communities. Unfortunately, there are no explicit relations for small Solar System bodies, and there is still no consensus among the minor planet community on which transformations are more accurate.

The aim of our work was to asses the validity of existing transformations applied on small bodies' observations. For this purpose, we observed the chosen bright Main-Belt asteroids and Centaurs in both Johnson-Kron-Cousins and Sloan photometric systems using the AGO 70 cm optical telescope located in Modra, Slovakia. In this poster, we will compare the results obtained from our observations and from photometric transformations applied on our collected data. We checked several sets of transformation equations found in literature. We will present our conclusions and show the application of the most suitable transformation relations on archive data on Centaurs obtained by various large telescopes in the past.

The results of our work are useful to the whole minor planet community and will be applicable on different types of small Solar System bodies: near-Earth asteroids, Main-Belt asteroids, Centaurs, etc. The transformations are especially interesting in the perspective of future Vera Rubin Observatory (VRO), which will implement the photometric system similar to the Sloan and provide exceptional data on physical and color properties of small Solar System bodies. Our validated transformations will allow the community to reliably compare the new VRO data with archive measurements.

Pracovisko fakulty (katedra)/ Department of Faculty

KAFZM

Tlač postru/ Print poster

Nebudem požadovať tlač posteru / I don't require to print the poster

Author: KUKSENKO, Vitalii (Comenius University)

Co-authors: LILLY, Eva (Planetary Science Institute); ŠILHA, Jiří (Comenius University); JEVČÁK, Peter (Comenius University)

Session Classification: Poster session + káva: prezentácie študentov Fyzika

Track Classification: Poster session + káva: prezentácie študentov: Poster session + káva: prezentácie študentov Fyzika