DEPENDENCE OF THE VALUE OF MINIMUM OF NEGATIVE POLARIZATION UPON ALBEDO FOR THE MOON AND LABORATORY SAMPLES

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The value of the negative polarization in minimum correlates with the albedo A if all data for the investigated asteroids are included [1] Such a correlation was found for the Moon [2]. In both cases a phenomenon similar to Umov's effect is observed: the higher A the lower $|P_{min}|$. Investigating this dependence by laboratory methods we found, that $A - |P_{min}|$ diagram has more complicated form than it was suppoused before. Two branches of $A - |P_{min}|$ dependence are clearly distinguished (Fig.1).

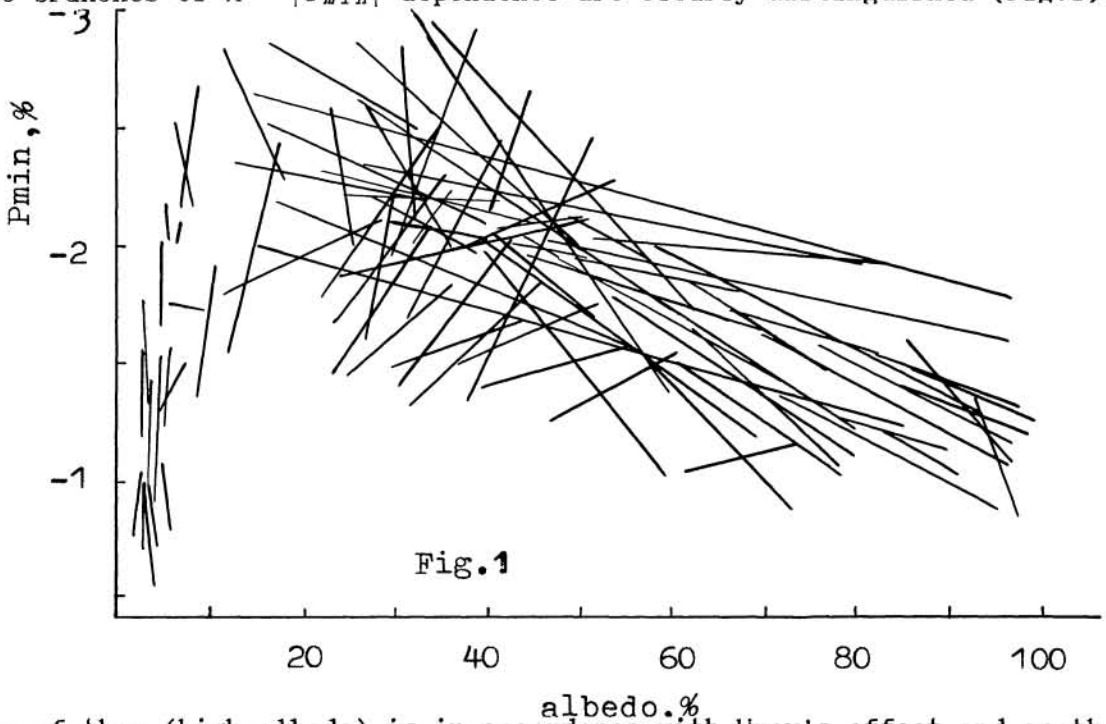


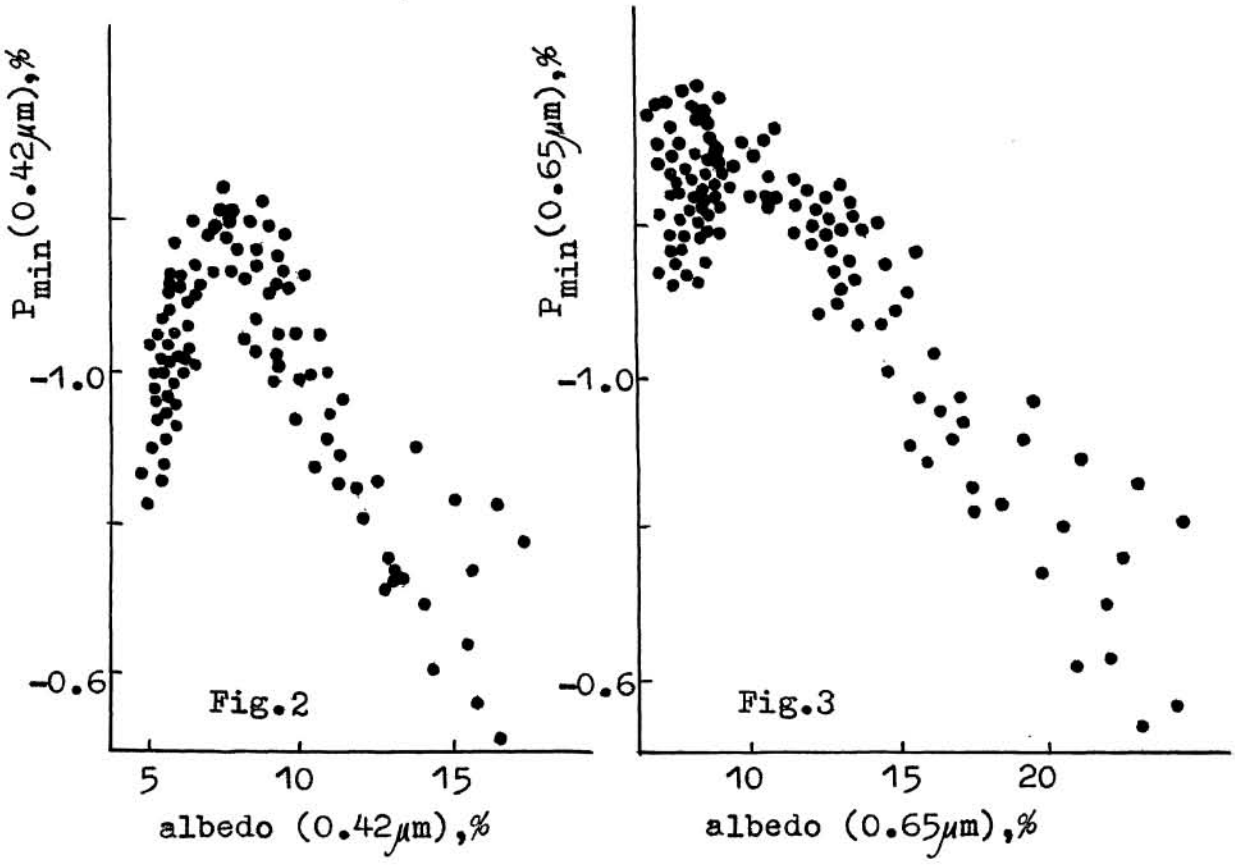
Fig.1

One of them (high albedo) is in accordance with Umov's effect and another (low albedo) displays inversed dependence. Plotting the laboratory diagram we used data for series of samples with large difference in albedo but of the same type of structure (substances of water-colours). The measurements were performed with polarimeter [3] at wavelengthes 0.65μm and 0.42μm. Data for each sample are presented as segments, their ends corresponds to measurements at two wavelengthes mentioned. Data of Fig.1 impeled us to investigate more closely the lunar $A - |P_{min}|$ diagram.

NEW LUNAR DATA. Photometric and polarimetric observations of the Moon were carried out with spectropolarimeter [4] on 60-cm telescope. Measurement accuracy not worse than 0.03% was achieved [5]. $A - |P_{min}|$ diagrams are shown on Fig.2 (λ_1=0.42μm) and Fig.3 (λ_2=0.65μm). In blue light the dependence is pronounced as in Fig.1, while in red light two branches of $A - |P_{min}|$ diagram are very weak. In general, the similarity of the laboratory diagrams (Fig.1) and the lunar ones (Fig.2, Fig.3) is only qualitative. On the other hand the very fact of the similarity for surfaces of to different nature indicates a common mechanism that is responsible for two branches of $A - |P_{min}|$ dependence.

DEPENDENCE OF THE NEGATIVE POLARIZATION UPON ALBEDO

Opanasenko N.V. et al.



For the lunar correlations we obtained following regresion equations:

blue range:

$$|P_{min}| = 0.769 + 7.71 \cdot 10^{-2}A - 5.03 \cdot 10^{-3}A^2,$$

(correlation coefficient $r = 0.699$);

red range:

$$|P_{min}| = 1.285 + 6.36 \cdot 10^{-3}A - 1.39 \cdot 10^{-3}A^2, \qquad (r = 0.867).$$

Here $|P_{min}|$ and A are represented in %.

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