OPTICAL PROPERTIES OF REINER GAMMA MAGNETIC ANOMALY ON THE MOON. V.V. Shevchenko. Sternberg State Astronomical Inst., Moscow University, Moscow 117234, USSR.

The Reiner Gamma formation coinciding in location with the largest magnetic anomaly of the near side of the Moon is not manifested in relief and identified only thanks to the surface reflectance properties. To calculate the mean albedo of the formation, results received by Saari & Shorthill(1) were reduced to the true full Moon on the strength of the data obtained by the author. The value constitutes 8.26%. A detailed albedo distribution has been deduced from brightness measurements of the "Zond-6" photographs at a topocentric angle of 7°75. The albedo values are given in the photometric system used by Saari and Shorthill in brightness measurements and are reduced to the true full Moon with the opposition effect taken into account. Fig. 1 shows a schematic of the Reiner Gamma photometric structure. Contours of equal albedo values are 1.0% apart. For the formation under consideration, the reflectance of the surface matter ranges from 6% to 13%. Of interest are dark regions inside the light formation which have an albedo value of 6%. In terms of reflectance, these regions are similar to the mare surface adjacent to Reiner Gamma.

A histogram in Fig.2 depicts the detailed albedo distribution. An albedo weighted average is equal to 8.22%.

The distribution is bimodal in character. The distribution obtained has been compared with two individual normal distributions (Fig.2) which best reproduce the empirical distribution over the whole lunar surface on the average in the albedo range of 5% to 12% (2). According to Kolmogorov's criterion, in this case normal distributions do not conform to the observed albedo distribution. Hence, it follows that the albedo of Reiner Gamma is distributed in the way which is inconsistent with the ratio of substances with various reflectance over the whole lunar surface on the average. Phase brightness variations measured by Saary & Shorthill (3) as compared to the mean photometric function (4) indicate a significant increase in brightness at elevated phase angles.

Fig.3 shows the dependence of \( \Delta \phi = \phi_R - \phi_c \) on the azimuth \( \alpha \). \( \phi_R \) is the measured brightness of Reiner Gamma in terms of the photometric function, \( \phi_c \) - the mean photometric function of the Moon.

The pattern followed by the phase brightness variations indicates a highly pronounced specular effect as light is reflected from the Reiner Gamma surface.

A maximum degree of polarization of reflected radiation is 10% with phase variations of the degree of polarization having the same pattern as the plateau of Aristarchus(5). According to Whitaker (6), these formations have similar colour parameters in the range of 6400 – 3700 Å as well despite the difference in albedo. The above optical properties of the Reiner Gamma surface make it possible to suggest an elevated content of glass particles and agglutinates in the surface of this region regolith.
OPTICAL PROPERTIES OF REINER GAMMA

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Fig. 1

Fig. 2

Fig. 3