CENTIMETER SIZE CROSSING RIPPLES BOTH ON THE NEAR AND FAR SIDES OF THE MOON (CHANG'E 3 & 4): MODULATION OF THE MOON'S ORBIT BY THE GALACTIC ROTATION.

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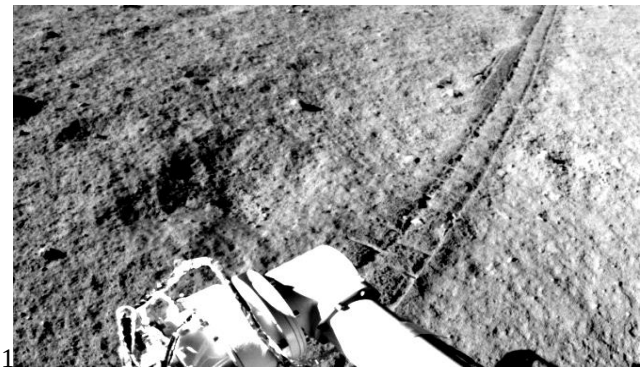
Intersecting ripples of certain wavelengths and produced them tectonic granules are inversely proportional to the satellite main orbital frequencies (1/1 month – πR/4 and 1/1 year- πR/60 for the Moon) and calculated side frequencies (division and multiplication of the higher frequency by the lower one- πR/15 and πR/240). Rare chances present the landings of the Chinese probes Chang'e 3 & 4 on the Mare Imbrium and the SPA Basin areas. Landing surfaces possibly cleaned by thruster jets of landing device revealed clear crossing lineation of a few centimeters spacing and produced them granules. This very fine granulation fortunately can be calculated comparing it with a track of the Yutu' rovers weels. (about 10 cm wide). An explanation of the granule size should be done with the above modulation procedure using two frequencies as was done for some celestial bodies earlier [1] . The Moon main frequencies are 1/1 year and 1/1 month, the modulating Galaxy frequency is about 1/200 000 000 years. A scale is the Earth's orbiting period 1 year with the corresponding tectonic granule size πR/4.

Calculations for the Moon:

(1y. : 200 000 000y)πR = (1 : 200 000 000) 3.14 x 1738 km = 5.46 cm wave length for the circumsolar orbiting (or 0.46 cm wavelength for the around Earth orbiting). By the same galactic frequency modulation one obtains enigmatic metric radio waves for the Sun and decametric waves for Jupiter. Radio emission of the Moon at 2.5 cm wavelength was described in Berezhnoi et al., 2001. It is worth to note that well known radio wave and gamma-ray background observations are added by soft X-rays emitting from various celestial bodies – from cold comets to the hot Sun and measured by the Chandra X-ray Observatory.

The Chinese Chang'E-1 orbiter was equipped with a passive microwave radiometer (MRM) to measure the natural microwave emission from the lunar surface. The microwave emission, characterized by a frequency-dependent brightness temperature, is related to the physical temperature and dielectric properties of the lunar surface. By measuring the brightness temperatures at different frequencies, detailed thermal behavior and properties of the lunar surface can be retrieved. The resulting maps show fine structures unseen in previous microwave maps that disregarded the local time effect. The new features revealed and their possible connections with the lunar geology were discussed. Daytime brightness temperatures are found to correlate well with TiO2 abundance by numerical analysis.

Thus, some relationship between lunar microwave emission and the geological background was discussed earlier. In the present work we show existence of the fine crossing rippling of the lunar surface at the microwave lengths and its origin indicating at galactic structuring trace [1] . Both the far and near sides, south and north of the Moon - thus, the whole body - are affected.



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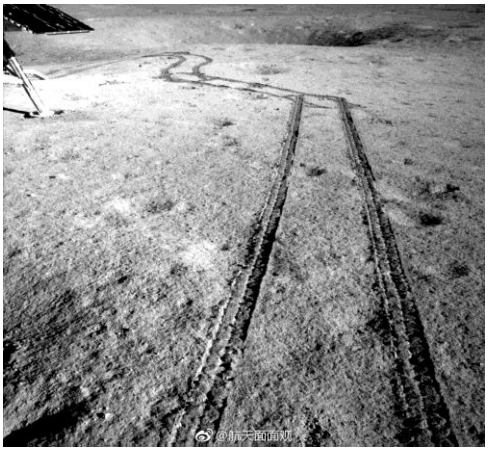

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Fig. 1. Yutu's rover weel track on Mare Imbrium surface clearly showing fine intercrossing lineation (centimeters spacing). A portion of Chang'E 3 image 00

Fig. 2. Image Chang'E 4 DwEFLIgUwAEMYFq-1(Credit: CNSA/CLEP) in the SPA Basin. Crossing centimeter spacing rippling.

[1] Kochemasov G.G. Modulated wave frequencies in the Solar system and Universe // Universal Journal of Physics and Application 12(4): 68-75, 2018. Doi: 10.13189/ujpa.2018.120402.