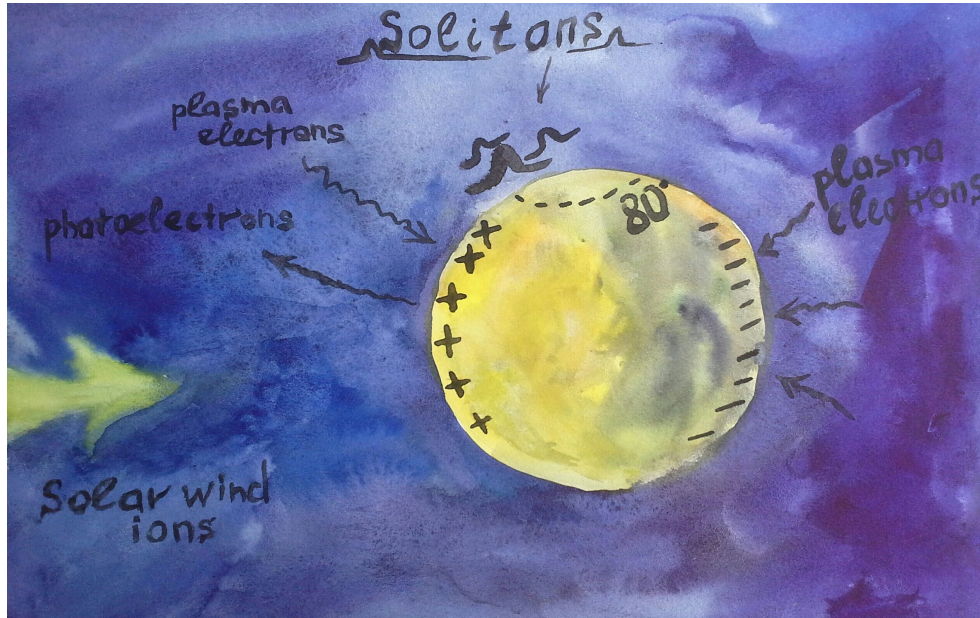


LUNAR DUST CHARGING

PROCESSES OF CHARGING OF LUNAR DUST IN THE DUSTY PLASMA NEAR THE SURFACE OF THE MOON IS SHOWN



Lunar dust charging and the region of existence of dust acoustic solitons.

The lunar surface is charged under the action of solar radiation, solar-wind plasma, and the Earth's magnetotail plasma. As a result of the interaction with solar radiation, the lunar surface emits electrons due to the photoelectric effect, which leads to the formation of a photoelectron layer over the surface. Dust grains flying over the lunar surface also emit photoelectrons due to their interaction with solar radiation. Dust grains situated on the lunar surface or in the near-surface layer absorb photoelectrons, photons of solar radiation, solar-wind electrons and ions, and (if the Moon is in the Earth's magnetotail) electrons and ions of the magnetospheric plasma. All these processes lead to the charging of dust grains, their interaction with the charged lunar surface, and the rise and motion of the dust. Solutions in the form of dust acoustic solitons corresponding to the parameters of the dust-plasma system in the near-surface layer of the illuminated Moon's surface can exist.

REFERENCES

- 1) Morozova, T.I., Kopnin, S.I., Popel, S.I. Wave Processes in Dusty Plasma near the Moon's Surface // Plasma Physics Reports. – 2015. – Vol. 41, № 10. – pp. 799–807.
- 2) S.I. Popel, T.I. Morozova. Wave Processes During Interaction of Magnetospheric Tail with Dusty Plasmas near the Surface of the Moon // Plasma Physics Reports (Formerly Soviet Journal of Plasma Physics). – 2017. – № 5. – pp 474– 484).
- 3) S. I. Kopnin, T. I. Morozova, and S. I. Popel, Dust acoustic solitons near the surface of the Moon // Trudy Moskovskogo Fiziko-Tekhnicheskogo Instituta. – 2017, V. 9, № 4.
- 4) Izvekova Yu.N, T. I. Morozova, and S. I. Popel, Interaction of the Earth's Magnetotail with Dusty Plasma near the Lunar Surface: Wave Processes and Turbulent Magnetic Reconnection // IEEE Transactions on Plasma Science, V. 46, Issue 4, Pp. 731-736, April 2018

AUTHORS & CONTACT INFORMATION

Tatiana Morozova
Space research institute of RAS (IKI)
timoroz@yandex.ru