

## ORIGIN OF A LUNAR REGOLITH. SIMULATION RESEARCH

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As known, the surface layers of moon are formed at the expense of bombardment with meteorites, sedimentation of ejections and partial condensation of partiñles. A major factor of its formation is the specific power of energy release. It can vary over a wide range, depending on a velocity and mass of bombarded particles. The velocity of particles is from 3 to 70 km/s, mass of meteorites is  $10^{-10}$ - $10^{10}$  g.

Thus, the formed surface layer of moon is regolith. This is a mixture of the solid partiñles of ejections are formed due to the meteoritic impacts, the solidified drops and a condensate of a vapor phase.

The purpose of the present work was a research of morphology and structure of a condensate. This condensate was formed during a shock destruction of basalt with the laser pulses. This process simulated a meteoritic effect.

The main attention in this article was given to study of a condensate under relatively low powers of the specific energy releases (up to  $10^8$  W/cm<sup>2</sup>). These values of power correspond to velocities of meteorites or their secondary splinters closed to 2.4 km/s.

The micrometeoritic effect was simulated with the pulsed laser affect. The criterion of energy release both for want of meteoritic impact and pulse la-

ser effect is fixed in a basis of simulation. In the present work the usual volcanic rock, i.e. basalt, was selected as investigated sample. The surface of the basalt was carefully polished and subjected to irradiation of the pulse laser. The laser irradiation wavelength was equal to 1.06 microns, energy of pulse was equal 100 J. Power density varied within the range from  $10^6$  to  $10^7$  W/cm<sup>2</sup>, pulse duration was  $\sim 10^{-3}$  s. The sample was fixed inside the special camera, with vacuum  $\sim 10^{-5}$  torr. The polished silicon plates and the aluminium foils were used for the collection of a condensate and scattering products of laser impulse influence. The thickness of a condensate layer was approximately 0.1 mm for want of repeated (some tens impulses) exposure of various sites of the basalt target.

It has been shown, that the morphology of a condensate surface in these simulation investigations partially correspond to real morphology of a moon surface rock. Both the spherical particles and the partiñle of an irregular form were formed. Besides the typical form shrinkholes was observed on the surface. It depends on conditions of condensation of liquid ejected droplets. Earlier was considered, that it is a result of a micrometeoritic effect.