MICROCOMETS AS A POSSIBLE SOURCE OF ORIGIN OF THE SURFACE WATER AND HYDROXYL LAYER ON THE MOON. M. P. Sinitsyn[1] [1] Moscow State University, Sternberg Astronomical Institute ,13 Universitetsky prospect,Moscow 119992,Russia (msinitsyn.sai@gmail.com).

Introduction: Currently achieved very significant preliminary results in the investigation of the origin and evolution of lunar hydrosphere. The first results of the LRO spacecraft and space experiment LCROSS, released recently in Science [1,2], provide ample material for research and analysis. Taking into account the results of previous programs [3,4,5] becomes clear very intriguing and contradictory situation. One of the striking contradictions is the different nature of the ice deposits in the northern and southern polar regions [1].

The fact that the radar onboard Chandrayan-1 is not found at the bottom of the crater Cabeus responses related to surface fragmented ice, but it found two dozen mid-sized craters in the northern polar region, with clear signs of a fresh surface of ice.

Discussion: As established by the spectrometer LEND[2], the location of high concentrations of hydrogen (a significant suppression of the flux of epithermal neutrons) beyond the area of the cold traps associated with the crater Cabeus. Similar differences between areas of high hydrogen content with the location of the cold trap is found in other craters of the southern polar region. From this it was concluded that ice lies under a layer of regolith thickness of several centimeters. Thus, in the south polar region were detected subsurface ice, lying at the depth expected in a few centimeters. At the same time, in the northern polar region revealed a fresh surface ice.

How is this possible?

It is obvious that if the reason for the formation of surface water and hydroxyl are considered the reaction of solar wind protons with the surface, then through of the process of migration [6], its distribution will occur equally to all poles. This character of the process will take place in connection with a fairly uniform formation of OH / H_2O almost everywhere across the surface of the moon. Thus, to explain the situation with a significant difference in the accumulation of water on the opposite poles rather search a source that consistently (right now) acts on the surface of the Moon. In addition, the effect of this source should be substantially anisotropic, for asymmetries in the accumulation of ice.

As pointed out Klumov and Berezhnoi[7], the collision of comets and asteroids with the Moon's surface creates temporary atmosphere, resulting in the capture probability of volatile elements cold traps is the same as in north and south polar regions. But if we assume that the size of the comet is quite small (about 10 meters), the differences in the accumulation of volatiles at different poles are possible.Therefore, in the case of pre-emptive fall microcomets in areas close to the North Pole, the formation of water ice will prevail in the northern polar region.

Unfortunately, at present, issues related to microcomets[8] poorly understood and very existence of such comets is somewhat controversial, but according to some estimates, about 100 events microcomets collision with the Earth occur annually. If we take into account the possibility of such a large collision frequency, then we can fully explain the constant replenishment of the surface layer of lunar water and hydroxyl groups. It is possible that these comets are to the same and galactic origin [9].

For a more complete confirmation of the differences in the accumulation of ice in the southern and northern polar regions is very interesting to examine the results of the neutron flux measurement device LAND also for the northern polar regions.

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