**SPECTRAL-FREQUENCY METHODS OF INVESTIGATING HYDRO-SILICATE SPOTS ON SURFACES OF ATMOSPHERE LESS BODIES.** V. V. Prokofjeva-Mikhailovskaja[1], V. V. Busarev[2] and A. N. Rublevskiy[1]. [1] Scientific-research Institute "Crimean Astrophysical Observatory", Nauchny, Crimea, 98409. Ukraine. E mail: prok@crao.crimea.ua. [2]Lunar and Planetary Department, Sternberg State Astronomical Institute, Moscow University, Universitetskij pr., 13, 119992. Moscow. Russian Federation. E mail: busarev@sai.msu.ru.

Now the number of catalogued objects of Solar system has considerably increased and comprises more than 300 000. But for the majority of these objects are known only elements of an orbit and magnitude. Use of large telescopes is impossible for the research of physical and chemical parameters of a plenty of minor planets. Therefore methods which allow investigating parameters of such objects by means of average telescopes are necessary at the moment.

The proposed spectral-frequency method of investigating atmosphere less bodies [1] is based on the registration significant of some integrated spectra of a point object and the frequency analysis of the spectra of parameters obtained at processing. The purpose of the method consists in obtaining estimations of sizes of the spectral details inherent to the investigated object using its rotation motion.

It is known, that on light curves of asteroids are observed a short-term increase or reduction of magnitude. The definition of their duration can be used for an estimation of the size of a detail on the surface of an asteroid under the formula taken from the book « Asteroids I » [2]:

$$L = \pi D\, \Delta t / P_{rot},$$

where L is the size of a detail of the surface, D is the diameter of an asteroid, $\Delta t$ is the duration of registration of a detail on a light curve, $P_{rot}$ is the rotation period of an asteroid.

Definition of the duration $\Delta t$ from observations usually causes difficulties, and authors have replaced $\Delta t$ with half of the detected period P/2. Then the formula will be transformed in

$$L = \pi D\, P/2P_{rot},$$

where L is the size of a spot, D is the diameter of an asteroid, P is the detected period, $P_{rot}$ is the rotation period of an asteroid.

On these estimations of the sizes of spots it is supposed, that they are located in the equatorial zone of an asteroid. For the search for the periods P which are less in size than the rotation period $P_{rot}$ of an asteroid, various programs of searching for the periodicity are used.

During the observation the condition of illumination of the object by the Sun should not vary considerably. The accuracy of analyzed data should be high, that should provide registration of periodicity with small amplitudes.

We described below the results obtained during investigations of spectral band of hydrosilicates about 0.44 microns in spectra of two asteroids. Spectrophotometrical researches of asteroids were carried out with a slitless afocal spectrograph on the half-meter telescope of the Scientific-research Institute "Crimean Astrophysical Observatory".

**Investigation of the asteroid 21 Lutetia [3**]. The object is one of M-type asteroids. Spectral researches of Lutetia have shown the presence of an appreciable absorption band with a center at 0,43 - 0,44 microns in reflectance spectra. Rapid variations of equivalent width of this band occurred on time intervals of about 1 h. For studying these variations the frequency analysis of 40 sizes of absorption bands equivalent width about 0,44 microns has been carried out. In total 16 significant periods have been found. The primary small sizes of spots allow us to make the conclusion about recent brought hydrosilicates on the surface of this asteroid at its collisions with primitive bodies.

**Investigation of the asteroid 4 Vesta [4].** Asteroid Vesta is the main object of spectral type V, its form is close to spherical. During observations the condition of illumination of the asteroid by the Sun varied slightly. In reflection spectra the absorption band is about a wavelength 4400 Å corresponds to hydrosilicates. By means of the frequency analysis the sizes of hydrosilicate spots and their distribution in longitude are obtained. Spots on the surface of the asteroid have mainly small sizes 12 - 50 km. These data strengthen the suggestion that hydrosilicates have been brought on surface of Vesta at collisions with the bodies which have come from a zone of the Jupiter.

Two large sizes are probably registered by congestions of fine spots also. Apparently, at collision pieces of the arrived body have scattered in different parties, according to the model of tangent collision of a body [5] and have extended over a big area. If collision was tangents then the distribution of the introduced hydrosilicates on the surface has was non-uniform. Our resultes confirm this fact.

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