LECTURE – 3. **THE SUN'S CONSTANT AND ITS CHANGES. THE INFLUENCE OF THE SUN ON THE CLIMATE OF THE EARTH.**

The radiation power coming from the Sun plays an important role in characterizing astrophysical phenomena. In particular, the intensity of solar radiation is one of the most important data in the formation of ideas about the physical processes taking place on the surface of the Sun and inside it. Accurate calculations of the radiation energy of the Sun are also necessary because the magnitude of this radiation is taken as a unit when calculating the radiation of many other celestial bodies. The power of solar radiation is considered to be the solar constant. The solar constant is the total amount of solar energy passing through a surface of 1 cm2 perpendicular to the direction of radiation coming from the sun during one minute, at the average distance from the sun to the earth (outside the earth's atmosphere).

The solar constant is measured using special instruments. To measure it, it is necessary to make hundreds of observations and calculations using two special instruments. One of these devices is called a pyrheliometer, with the help of which the total energy of the Sun falling on the surface at a certain time (at a certain height of the Sun on the horizon) is calculated in absolute energy units. However, the data obtained using a pyrheliometer will not be sufficient to calculate the solar constant, because a certain part of the solar energy is absorbed by the Earth's atmosphere. The sun's absorbed energy is measured using another special instrument - a spectrobolometer. The sensitivity of this instrument to different wavelengths of radiation is the same, with the help of this tool, a graph is drawn that characterizes the relationship of the radiation intensity of each wavelength to the air mass. Air mass is the quantity measured by the ratio of the optical thickness of the air layer in a certain direction to its optical thickness in the zenith direction. Using extrapolation, the radiation intensity is determined when the air mass is zero. This value is equal to the value of the light when it is not absorbed by the Earth's atmosphere. Such an operation is performed for all sections of the spectrum, and the distribution of energy in the solar spectrum, determined with the help of a spectrobolometer, is corrected using the obtained data. It should be noted that in a spectrobolometer, the amount of intensity is given in relative units, unlike in a pyrheliometer. To the identified data, If the radiation energy emitted by the Sun in ultraviolet and infrared rays and completely absorbed by the Earth's atmosphere is added, then the total energy of the Sun falling on a certain surface is found. The Solar Constant is then calculated based on this determined amount of energy.

The radiation energy in the ultraviolet and infrared regions of the Sun's spectrum is determined with the help of satellites and instruments released from the Earth's atmosphere. Solar constant determined using the method mentioned above:

is The correctness of this quantity was confirmed in the following years by comparison with the value of the solar constant, which was determined using a pyrheliometer installed on rockets and balloons.

The total energy of the Sun is found if the magnitude of the solar constant is multiplied by the surface of a sphere with a radius of 1 astronomical unit. The total energy of the Sun, defined in this way:

equal to