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The Influence of Moonbeams on Power Measuring Instruments

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The scientific community is arguing on the problem of the moonbeam's influence on electric energy metering devices. In particular, there is a hypothesis that the light of the moon can increase the error of digital power meters built on the Analog Devices chips. This, in turn, can lead to an increase in commercial power losses in operating electrical networks.

The proponents of the hypothesis assert that during the full moon, when the heavenly body is the brightest, the photons of moonlight will 'bombard' the surface of the microprocessor most actively. In the 'bombardment', each photon will give the microprocessor additional energy (quanta), which is

$$E_{ph} = h \cdot \nu = \frac{hc}{\lambda} = \bar{h}\omega,$$

where ν is the frequency, λ is the wavelength of a beam, $h = 6,626 \cdot 10^{-34} \text{ J}\cdot\text{s}$ is the Planck constant, $\bar{h} = \frac{h}{2\pi} = 1,05 \cdot 10^{-34} \text{ J}\cdot\text{s}$ is the reduced Planck constant, ω is the angular frequency.

Due to this extra energy, the surface of the microprocessor will be overheated and electronic series of 0's and 1's will be processed with a mistake. Thus, the random error of measuring instrument will occur.

To check this hypothesis, the scientists of the EPE Department conducted a series of experiments with the power meter built on the basis of a microcontroller Motorola, HC08 family with FLASH memory located on a chip. A resistive load of 100 W was connected to the meter. The meter readings were registered every half hour. 50 readings were taken during the full moon and 50 in the dark room. The research was being conducted during last 4 months. The following assumptions for the experiment were made: 1) the electric energy meter does not have a body, and the moonbeams can freely fall onto the microcontroller; 2) the moonbeams fall on the microcontroller at an angle of 45°.

It has been experimentally proven that moonlight does not affect the readings of power measuring instruments or its influence is so scanty that it can't be fixed by the meter.