



Monthly and semimonthly lunar oscillations in noctilucent and tropospheric clouds

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Monthly and semimonthly lunar synodical oscillations in a number of NLC appearances were discovered by Kropotkina and Shefov [1]. Now we investigated similar thing for a conditional NLC occurrence probability for a clear summer night (COPCN), basing on special Moscow NLC observation program from 1962 up to present time [2]. Not only periods $T_1=29.53$ and $T_1/2=14.77$ days, connected with synodical month are found, but as well periods $T_2=27.32$ and $T_2/2=13.66$ days, connected with lunar declination variation and $T_3=27.55$ and $T_3/2=13.78$ days, connected with varying lunar distance from the Earth. For all these periods, NLC appearances demonstrate a statistically significant response [3]. Moreover, all these periodicities were discovered also in summer nighttime tropospheric cloudiness for Moscow region, through an analysis of the summer probability of a clear night, vs. a lunar position. The relative response of NLC is stronger than that of tropospheric cloudiness. But even for the latter the monthly percentage modulation is as large as 5% (response to a lunar phase variation and to a declination variation) and 2% (response to a distance variation). The probability of the corresponding statistical significance is 0.97-0.99. For the semimonthly signal in tropospheric cloudiness the $T_2/2$ period dominates, providing the 4% percentage modulation.

- References:** 1. Kropotkina, Ye. P., and Shefov, N. N., 1976. *Izvestiya, Atmos. and Oceanic Phys.* 11, 741-742
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