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Comment on the paper by Dalin, Pertsev and Romejko "Significance of lunar impact on noctilucent clouds"

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Abstract

A critical review of the paper by Dalin, Pertsev and Romejko "Significance of lunar impact on noctilucent clouds" , JASTP 2006, is presented.

Keywords: Noctilucent clouds, Moon influence, Mesosphere

I note with interest the study by Dalin, Pertsev and Romejko (2006) on the influence of Moon position on the frequency of noctilucent clouds (NLC). The problem is not a new one, because for many years researchers have sought a relationship between the Moon and NLC, and more generally mesospheric constitution.

In general the observations which have been used by Dalin et. al. are very few inhomogeneous and not valid statistically. The observers were mostly amateurs without much experience in atmospheric physics, and it is known that the Russian data often are questionable. One example is the so-called winter observations of NLC which has been pointed only by Russian data, never from other long-term series from other countries (Europe, USA, cf. e.g. Fogle, 1964, Schröder, 1970)

To understand the problem in finding periodicity in NLC activity, we should note following points. The first complete and reliable data was observed between 1885-1898 by Jesse using visual and photographic techniques. These were followed in Germany by the observations of increased airglow between 1922-1967 by Cuno Hoffmeister, who also looked for NLC. Between 1898-1956 various sporadic data are also available from Germany. The most complete series is that from Rönnebeck since 1957. For USSR and Russia, before 1957 there are no complete data sets. That used by Dalin et. al. are mostly sporadic observations by very inexperienced observers. Since 1957 several groups in the USSR have taken observations, but also for a period of few years with variable quality. Therefore Dalin's data-set is not very convincing. In America good data has been collected by Fogle since 1963 for some years, but not a long series of observations. The Western Europe data, used e.g. by Gadsden (e.g. Gadsden and

Schröder, 1989) is also of variable quality and contributed by an inhomogenous network of amateurs.

In general, we must see that for all research to find periodicities or relationship in this visual data, that all of these not complete and not in the necessary case valid. Conclusions from these data are very limited and questionable. It is dangerous to seek periodicities in sporadic sets of observations made by disparate groups of observers.

With this background and analysis given by Dalin et. al has no fundamental basis. Physically the genesis of NLC is dependent on the moisture, the absence of turbulence, the presence of nucleous particles and the time between the mesospheric transitions. These are the fundamental requirements for the generation of NLC. The atmosphere near the mesopause is a dynamical body which is mainly controlled by the wind and temperature and these are components do not physically depend on the position of the Moon. Therefore all conclusion of a Lunar periodicity make no sense physically.

What is needed are long-term observations from the ground, photographs and satellite, but these are not yet available. Furthermore past observations have been made from a relatively small part of the Earth.

A proper coordinated global watch for NLC using consistent techniques would certainly be valuable in resolving outstanding problems in this field.

Reference:

Dalin, P.A., N.N. Pertsev, V.A. Romejko. 2006 Significance of lunar impact on noctilucent clouds. Journal atmospheric and solar-terrestrial physics , 68,1653-1663

Fogle, B.1964. Noctilucent clouds. University Alaska G R 164.

Gadsden, M., and W. Schröder, 1989. Noctilucent clouds. New York: Springer.

Schröder, W., 1967. Studies on noctilucent clouds during the years 1957-1966. Gerlands Beitäg zur. Geophysik, 76, 133.

Schröder, W. 1970. On noctilucent clouds. Zeitschrift für Meteorologie 22. Heft 6