First assessment of noctilucent cloud variability at midlatitudes

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Cloud in Nepali sky. Credit: Wikipedia

As the Sun dips below the horizon, the last rays of light can glint off crystals of ice high in the atmosphere, lighting up the sky with an electric blue glow. Known as noctilucent clouds, these collections of ice crystals occur most often at high latitudes, but the long polar days make them difficult to see. With the eye, noctilucent clouds can best be seen at night between 50 degrees and 60 degrees latitude in both hemispheres.

Investigations with other techniques, such as lidar, however, have made noctilucent clouds easier to detect during the day as well as at night. Though they show up less than 10 percent of the time at midlatitudes, noctilucent clouds are an important component of the summer atmosphere. Their properties and occurrence may indicate patterns of

behavior in the middle atmosphere.

Gerding et al. are the first to have measured the daily variation of noctilucent cloud behavior at midlatitudes from the ground. From a research site in Kühlungsborn, Germany, a town located near 54 degrees north, the authors used a suite of equipment, including lidar, to study how noctilucent clouds evolve throughout the day. From 1,800 hours of summertime observations, the authors find 100 hours that contained noctilucent clouds and observe within them recurrent daily patterns in brightness and activity. The data show that noctilucent cloud activity rises and falls with local solar time, being highest at 5 a.m. and lowest at 7 p.m., with a secondary maximum at 2 p.m. Cloud brightness peaks twice, once at 4 a.m. and once at 6 p.m.

The authors find that noctilucent cloud activity is not related to tidal temperature variation at noctilucent cloud altitudes. Rather, they find that noctilucent cloud activity for their location is highest after a bout of southward polar wind and lowest during weak or northward winds.

More information: Diurnal variations of midlatitude NLC parameters observed by daylight-capable lidar and their relation to ambient parameters, *Geophysical Research Letters*, DOI: 10.1002/2013GL057955 , 2013 onlinelibrary.wiley.com/doi/10 … 013GL057955/abstract

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