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A PROPOSAL TO WATCH SOUTHERN HEMISPHERIC NOCTILUCENT CLOUDS WITH CCD IMAGERS (EXTENDED ABSTRACT)

Takuya SUGIYAMA[1], Masaki TSUTSUMI[2], Takuji NAKAMURA[1] and Shoichiro FUKAO[1]

[1]*Radio Atmospheric Science Center, Kyoto University, Gokanosho, Uji 611-0011*
[2]*National Institute of Polar Research, Kaga 1-chome, Itabashi-ku, Tokyo 173-8515*

In recent years noctilucent clouds (NLCs) have gained interests as a possible tracer for the earth warming through an increase of their occurrence frequency (GADSDEN, 1990; THOMAS, 1996). There is no professional routine observations of NLCs, because bright NLCs do not occur so frequently but, for example, only 5 times in a summer (GADSDEN and SHRÖDER, 1989). Then at present a statistical study of NLC occurrence depends on collected reports of amateur observers.

Polar mesospheric summer echoes (PMSEs) are thought to be caused by invisible charged ice particles which will be grown up to NLC particles (CHO, 1993; CHO and RÖTTGER, 1997). SUGIYAMA *et al.* (1996) found that strong PMSEs tend to occur with a period of 5.5 days. GADSDEN (1985) have found a 5 day periodicity in bright NLC occurrence, and the periodicity is also investigated by SUGIYAMA (1998) as an inherent nature of NLCs but not due to weather conditions in the lower atmosphere. The PMSE observations are advantageous in the study of NLC, because radars are active on day and night under all weather conditions.

The Solar Mesosphere Explorer satellite have revealed polar mesospheric clouds (PMCs) to be a regular feature both of the arctic and antarctic mesosphere during summer solstice (OLIVERO and THOMAS, 1986; THOMAS and OLIVERO, 1989). Recent observations of water vapor content by the UARS satellite show similar feature both in arctic and antarctic summer mesosphere (PUMPHREY and HARWOOD, 1997). While BALSLEY *et al.* (1995) reported southern PMSE is weaker than northern one by 25 to 30 dB, HALL (1995) suggested that further observations with powerful radars are required at near solstice.

To investigate long-term tendency of NLC occurrence we need to record NLCs objectively; their intensity, extension, duration, and also negative reports on clear nights with no NLCs. For this purpose CCD imagers are adequate. Figure 1 shows NLCs taken with a CCD imager in Sweden in 1997, showing that a rather cheap CCD camera on the market can record NLCs.

NLCs in the southern hemisphere have been reported only quite scarcely (FOGLE, 1965). We are planning to watch southern hemispheric NLCs from 7 to 25 January 1998 at Punta Arenas (53.0°S, 71.0°W) in Chile and Ushuaia (54.8°S, 68.3°W) in Argentina. If we would succeed in observing southern NLCs in 1998, it will contribute to an extending program of southern NLC observations with automatic CCD imagers and also southern PMSE observations with a powerful radar.

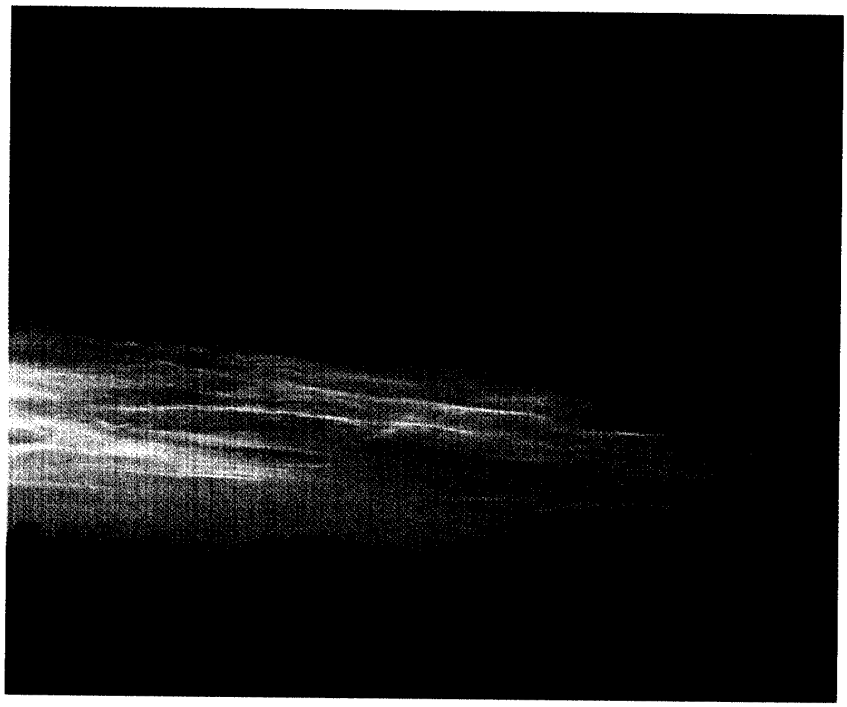

Fig. 1. A noctilucent cloud at 2307 UT on July 24 in Stockholm, Sweden, taken by one of the authors (T.S.); Kodak digital camera DC-120; ISO 160 equivalence, $f=7$ mm (38 mm equivalence for 35 mm camera), F2.6, 16 s exposure, and with a horizontal electric field transmission filter (30%). The star on the right hand side is Capella.

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