

A daytime observation of polar mesospheric clouds with Syowa Rayleigh Raman lidar system equipped with a new etalon unit

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A Rayleigh/Raman lidar system has been operated by the Japanese Antarctic Research Expedition (JARE) since February, 2011 (JARE 52nd) in Syowa Station Antarctica (69.0S, 39.5E). Polar Mesospheric Cloud (PMC) was detected by the lidar at 22:30UT (+3hr for LT) on Feb 4th, 2011, the first day of a routine operation. This event is the first time to detect PMC over Syowa Station by a lidar [Suzuki et al., 2013]. However, signal to noise ratio (SNR) of the PMC event was not so good due to a large shot noise from a daytime background signal. Moreover, a receiver system was mainly designed for nighttime observations. Therefore, observation of PMC during the midnight Sun, which also corresponds to PMC most active period, was difficult. Thus, to improve SNR of the PMC observation with Syowa Rayleigh/Raman lidar during daytime, a narrow bandpass Fabry-Perot etalon system has been developed and installed in the receiver system on Dec 2013 by JARE 55th. In this paper, Prompt report of a PMC observation with Syowa Rayleigh Raman lidar system equipped with the new etalon unit is presented.

Keywords: polar mesospheric cloud, noctilucent cloud, lidar, Antarctic