A MULTI-WAVELENGTH RESONANCE LIDAR SYSTEM FOR THE ANTARCTIC MIDDLE AND UPPER ATMOSPHERE OVER SYOWA (69S, 39E)

TAKUJI NAKAMURA 1, Makoto Abo 2, Yasukuni Shibata 2, Takuya D. Kawahara 3, Tsukasa Kitahara 4, Kazuyo Sakanoi 5, Kaoru Sato 6, Mitsumu K. Ejiri 1, Masaki Tsutsumi 1, Yoshihiro Tomikawa 1

1. National Institute of Polar Research, Tokyo, Japan
   e-mail: nakamua.takuji@nipr.ac.jp
2. Tokyo Metropolitan University, Tokyo, Japan
3. Shinshu University, Nagano, Japan
4. Toba National College of Maritime Tech., Mie, Japan
5. Komazawa University, Tokyo, Japan
6. University of Tokyo, Tokyo, Japan

As a part of six year project of Japanese Antarctic Research in 2010 – 2016, a study of interactions between the polar middle and the upper atmospheres using a new resonance lidar system will be carried out. The lidar will be collaboratively operated with existing optical and radar instruments in and around Syowa, as well as a huge atmospheric radar, PANSY, to be installed at Syowa. The lidar system consists of a Rayleigh lidar with a THG of Nd:YAG laser, and a resonance scatter lidar with a couple of Alexandrite lasers of transmitting both a primary wavelength and SHG. The target atoms and ions are Fe, K, Ca+ and N2+, and temperature profiles are also measured. Measurement of ion profile is the first time over Syowa, and interaction of ionosphere and neutral atmosphere is one of the interesting target. Daytime filter is also to be equipped in order to measure PMCs in summer, as well as daytime temperature measurement. The installation at Syowa will be in 2010 for the Rayleigh system, and 2012 for the resonance system. Before installed at Syowa station, the lidar system will be operated in Japan, especially with the MU radar and other observation instruments.

Resonance lidar, MLT region, Polar Mesospheric Clouds

Takuji Nakamura, National Institute of Polar Research, 10-3 Midorichi, Tachikawa, 190-8515 Tokyo, Japan, tel: +81-42-512-0656, fax: 528-3499, e-mail: nakamura.takuji@nipr.ac.jp