LODEWAVE: LOng-Duration balloon Experiment of gravity WAVE over Antarctica

Yoshihiro Tomikawa[1,2], Kaoru Sato[3], Yoshitaka Saito[4], Isao Murata[5], Naohiko Hirasawa[1,2], Masashi Kohma[3], Kyoichi Nakashino[6], Daisuke Akita[7], Takuma Matuso[8], Masatomo Fujiwara[9], and Rihito Yoshida[2]

[1]*National Institute of Polar Research*

[2]*The Graduate University for Advanced Studies, SOKENDAI*

[3]*The University of Tokyo*

[4]*Japan Aerospace Exploration Agency*

[5]*Tohoku University*

[6]*Tokai University*

[7]*Tokyo Institute of Technology*

[8]*Meiji University*

[9]*Hokkaido University*

Super-pressure balloons (SPBs) can float at a constant density surface in the troposphere and stratosphere for long duration (i.e., several months). They can follow Lagrangian motions of air parcels, which is beneficial for gravity wave studies. Gravity wave is one of uncertain factors in current climate models, in which it is required to obtain its stochastic features as well as its spatial and temporal mean behavior. SPBs enable us to obtain stochastic features of gravity waves in a full frequency range from Brunt-Vaisala frequency to inertial frequency. On the other hand, the PANSY radar, which is only MST/IS radar in the Antarctic, has been operated at Syowa Station since 2012. It measures three-dimensional winds with high temporal and vertical resolution and can obtain stochastic features of gravity waves in a full frequency range. It is expected to obtain three-dimensional gravity wave features in the Antarctic by combining SPB and PANSY observations. Thus, our group proposes new SPB observations in the Antarctic.