R005-04
A 会場 ：11/24　PM1 （13:15-15:15）
14:00〜14:15

#中村 卓司 [1)], 江尻 省 [1)], 木暮 優 [2)], PERWITASARI SEPTI[3)], 冨川 喜弘 [1)], 堤 雅基 [1)], 水野 亮 [4)], 津野 克彦 [5)], 小川 貴代 [5)], 和田 智之 [5)], Salvador Jacobo[6)]
([1] 極地研, [2] 九大・理・地惑, [3]NICT, [4] 名大・宇地研, [5] 理研, [6]CONICET, アルゼンチン

Gravity waves observed by OH arirglow imaging at Rio Gallegos, Argentina, near Andes: horizontal phase velocity spectrum analysis

#Takuji Nakamura[1)], Mitsumu K Ejiri[1)], Masaru Kogure[2)], SEPTI PERWITASARI[3)], Yoshihiro Tomikawa[1)], Masaki Tsutsumi[1)], Akira Mizuno[4)], Katsuhiko Tsuno[5)], Takayo Ogawa[5)], Satoshi Wada[5)], Jacobo Salvador[6)]
([1]National Institute of Polar Research, [2]Department of Earth and Planetary Sciences , Kyushu University, [3]National Institute of Information and Communications Technology, [4]Institute for Space-Earth Environmental Research, Nagoya University, [5]RIKEN, [6]CONICET, Argentina

Atmospheric gravity waves play important roles in couplings in the terrestrial whole atmosphere, by transporting momentum and energy vertically and horizontally. There are various sources of gravity waves such as meteorological disturbances, surface topography, instability of jet stream, etc. Recently the secondary wave generation caused by breaking gravity waves in the middle atmosphere has been recognized as a very important process because those waves can propagate into higher altitudes and play a great role of transporting momentum and energy to higher altitudes and furthermore efficiently propagate beyond the MLT region into the thermosphere/ionosphere to causes disturbances there. One of the gravity wave hot spots is the region of Antarctic peninsula and the Andes, where strong mountain waves are excited by the tropospheric winds and the topography.

We have been carrying out OH airglow imaging observations (˜87 km altitude) at Rio Gallegos, Patagonia, Argentine (51.6S, 69.3W) near the Andes since late 2017. In this study, we report the gravity wave horizontal phase velocity spectrum, i.e., the distribution of the gravity wave energy in the 2-D horizontal phase velocity domain observed in 2018.

In 2018, we obtained 138 nights of clear-sky and moonless images. The characteristics of the airglow images at Rio Gallegos were the quasi-stationary waves, suggesting the effect of mountain wave, and the wave breaking events, suggesting large amplitude of the waves. These suggest that the observation site, Rio Gallegos, is located under the region of strong gravity wave activity due to the Andes mountains. These characteristics show similarity with the finding by Pautet et al., (2021) by winter-time observation at Rio Grande (54S, 68W), but the quasi-stationary waves by our observation seem to be less frequent.

Horizontal phase velocity spectral analysis (M-transform, Matsuda et al., 2014) has been applied to pick up the waves with periods of 5-60 min, and with horizontal wavelengths of 10-100 km. We found that the spectrum was very widespread up to 150 m/s, and very frequently clear signal of wind filtering (wind blocking) due to the stratopause zonal wind. In summer (Nov-Feb) primary propagation was eastward. In early (Mar-April) and late (ASO) winter, phase speed is fast/broad and showing clear wind blocking. In mid-winter, spectral peaks spreads to E-W around zero. Gravity wave energy (I'/I) seems to be the largest around August-September, and larger than Syowa station where the late winter peak is not clear. Summer sub-peak also recognized.

Our observation results indicate that the horizontal phase velocity spectrum is a useful way to investigate to identify the altitude range of the generation of the gravity waves observed in the airglow layer at around 85-90 km height.