

Gravity Wave Activities in the Upper Mesosphere observed at King Sejong Station, Antarctica (62.22°S, 58.78°W) and Their Potential Sources in the Lower Atmosphere



Laboratory for tmospheric Dynamics

Introduction

and so on), play a major role in determining the spatiotemporal structure transferring momentum and energy from the lower to the higher altitudes (Li	re nd
In the mesosphere, GW breaking are frequently observed (Nappo, 2013), and accompanied by GW breaking are essential in accounting for the thermesosphere.	1 rr
Southern hemisphere (SH) high-latitude region is one of the highest middle King Sejong Station (KSS) of Korea Polar Research Institute is located in activity along the Antarctic Peninsula (Eckermann and Preusse, 1999; Ern et al., 2004; Hen winds at KSS have been observed using a very high frequency (VHF) meter al., 2013).	e t ndr
 Understanding the impacts of GWs in large-scale circulations in polar region about GW sources and their propagation processes. Orography has long be source (Fritts and Alexander, 2003; Kim et al., 2003). In particular, in the polar region, more 	ne ee ou
The tropospheric jets with surface frontal system can also be another GV stratosphere has also been considered as an important source of GWs.	N
 There has been little research on impact of convective GWs on the polar regions of strong convection are far from the polar region. However, winter primary region for large magnitude of cloud-top momentum flux of GWs (s and Chun, 2013; Kang et al., 2017). Considering that KSS is located at about 62°S, high-latitudes, deep convection in the storm-track regions should be conside observed in the mesosphere at KSS, if poleward propagation of GWs are convector radar at KSS. To estimate the GW variability, we propose an implementeor radar at KSS. To estimate the GW variability, we propose an implementeor for the GW variance to surface winds perpendicular to the mound diagnostic, and convective GW momentum flux in the lower atmosphere. propagations of orographic GWs into the upper mesosphere without correlation analysis, we examine whether the jet stream and the deep convective be a source of GWs in the mesosphere. 	r So t le ns er rc nt V ct
Horizontal Wind Variances	
2007 2008 2009 2010 2010 2010 2010 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2011 2012 2010 2013 2014 Monthly arg. (2007-2014) 100 96 92 98 84 85 85 85 85 85 85 85 85 85 85	
Summary and	
 Meteor radar at KSS in the Antarctic Peninsula are used to analyze wint A semi-annual variation of GW activities in the upper mesosphere with maximum GW variance appears in August–September. GWs generated by orography can reach the upper mesosphere without et the mesosphere in wintertime. 	d nc h

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