



## **Localized Internal Gravity Waves Breaking Region and its Implications for Middle Atmospheric Circulation and Stratosphere-Troposphere Exchange**

Petr Šácha (1), Petr Pišoft (1), Aleš Kuchař (1), Friederike Lilienthal (2), and Christoph Jacobi (2)

(1) Charles University in Prague, Faculty of Mathematics and Physics, Department of Atmospheric Physics, Czech Republic,

(2) Institute for Meteorology, University of Leipzig, Stephanstr. 3, D-04103 Leipzig, Germany

Internal gravity waves are widely recognized to contribute significantly to the energy and angular momentum transport. They play significant role in affecting many of the middle atmospheric phenomena (like QBO or Brewer-Dobson circulation). Using the GPS RO density profiles, we have discovered a localized area of enhanced IGW activity and breaking in the lower stratosphere of Eastern Asia/North-western Pacific region.

Using a mechanistic model for the middle atmosphere, 3D EP flux and residual circulation diagnostics, we investigate longitudinal variability of the Brewer-Dobson circulation and a hypothesis of its enhanced branch in this region. Further, we study possible formation and propagation directions of planetary waves caused by such a localized forcing and discuss the consequences for the stratosphere-troposphere exchange and polar vortex stability.