

Spectral filtering of gravity waves in the QBO: results from high resolution ICON simulations

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In order to investigate the driving of the QBO a high-resolution, convection-permitting run of the ICON model with 5km grid spacing was performed. We analyze the GWs in the model by applying a small-volume sinusoidal fit. By using a cascade of cube sizes, horizontal wavelengths of 150km - 2000km are addressed. This acts as a compromise between spectral resolution and spatial location. Phase speed spectra and GWMF can be reconstructed for individual regions and single snap-shots. Via comparison of phases from wave fits of temperature and winds, the vertical propagation direction of individual waves can be separated and ray-tracing can be initialized accordingly.

Using the results of this analysis we study the effect of the critical level GW filtering by comparing the variation of phase speed spectra by means of blocking diagrams.

Despite the generally good agreement, GWs with unexpected phase speeds at altitudes are present. Potential reasons are discussed.

Primary author: Dr KHORDAKOVA, Dina (Forschungszentrum Jülich)

Co-authors: FRANKE, Henning (Max-Planck-Institute for Meteorology); Dr ERN, Manfred (Forschungszentrum Jülich); Dr GIORGETTA, Marco (Max-Planck-Institute for Meteorology); Dr PREUSSE, Peter (Forschungszentrum Jülich)

Presenter: Dr KHORDAKOVA, Dina (Forschungszentrum Jülich)

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