

Task & Data Analysis

Name of Dataset: RO - Climate (Radio Occultation)

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File: RO_refr.txt, RO_temp.txt

Scenario

The Story:

We provide two radio occultation (RO) data sets. The RO method is a remote sensing technique making use of GPS signals to retrieve atmospheric parameters (refractivity, pressure, geopotential height, temperature) in the upper troposphere-lower stratosphere (UTLS), which we define as region between around 5km and 35km height.

The data, atmospheric monthly means, is given at

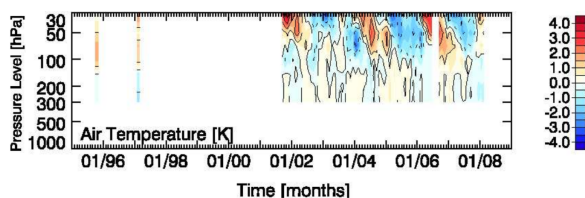
9 height levels (between 8.5 km to 28 km height),

18 latitudes (90°N to 90°S, 10° steps), and

96 months (intermittently 2001 to 2008, see below).

Temperature and refractivity data are provided. Refractivity can be thought of as atmospheric density and is approximately indirectly proportional to temperature. The data are provided from the Wegener Center for Climate and Global Change, University of Graz.

The sonification shall allow hearing the QBO (Quasi biennial oscillation), a stratospheric pattern of changing temperatures (wind directions), best pronounced in the tropics (10°N–10°S). An extra-tropical QBO signal can be probably found at higher latitudes with a different phase.



The Keys:

<i>Question:</i>	Where do you find the strongest QBO signal?
<i>Answers:</i>	Tropical Stratosphere
<i>Subject:</i>	Atmospheric patterns
<i>Sounds:</i>	e.g. wind, as the pattern is a wind pattern, temperature changes are due to wind direction (easterly, westerly) changes

TaDa

The Task:

1. find the QBO in the tropical region
2. find the extra-tropical QBO (time/phase lag) at higher latitudes
3. compare the two parameters (refractivity and temperature)

Purpose: analyse, confirm, identify, track

Mode: interactive/ focus

The Information:

Level: intermediate

The Data:

refractivity [N-units], dry air temperature [K]

<i>Type:</i>	ratio
<i>Range:</i>	temperature: 0 K – 300K refractivity: 1 N-Units – 150 N-Units
<i>Organisation:</i>	atmospheric grid, time & location (height, latitude) zonal means (all longitudinal values averaged) 18 latitudes x 9 height levels x 96 time steps (months, 01/2001 – 12/2008, but 01/2001–08/2001 NaN, 08/2008–12/2008 NaN, one month in summer 2006 NaN)

