



Long-term Variation of Temperatures and Wind Velocities from Earth based Doppler-wind and Temperature Measurements in Venus Upper Atmosphere between 1990 and 2013 using the Infrared Heterodyne Spectrometer THIS

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Dynamics of the Venusian atmospheric transition zone between the sub-solar to anti-solar (SS-AS) flow dominated region above 120km and the superrotation dominated region below 90 km is not yet fully understood. Temperatures in the same region are not very well constrained and we lack in a comprehensive understanding of this atmospheric region. Therefore direct measurements of these parameters on various time scales and on different locations on the planet are essential for validation of global circulation models and a comprehensive understanding of the atmosphere.

Such observations can be provided by the infrared heterodyne spectrometers THIS (University of Cologne) and HIPWAC (NASA GSFC). Operating around $10\mu\text{m}$ both instruments fully resolve CO_2 non-LTE emission lines for Doppler-wind and temperature retrievals at a pressure level of $1\mu\text{bar}$ (~ 110 km). In addition to this “one-altitude” information the broader CO_2 absorption lines can be used to gain information about the temperature profile lower down in the atmosphere (~ 60 - 90 km).

Long term variability in Doppler-wind velocities and temperature at ~ 110 km from campaigns between 1990 to 2013 will be presented. A report about local wave activities will be included. In addition recently retrieved temperature profiles from 60 to 90 km will be shown.