



## **Thermal wind in the Venus mesosphere from the VIRTIS/Venus Express temperature sounding.**

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Venus mesosphere (60 - 100 km altitude) is a region characterized by a complex dynamics: a retrograde super-rotation dominates in the lower part, while a solar-antisolar circulation can be observed in the upper part. Previous studies (Newman et al., 1984) have shown that the strong zonal winds with a speed reaching 120 m/s at the cloud top (70 km) are compatible with the thermal wind equation derived in cyclostrophic approximation. This in turn implies approximate balance between the centrifugal force and the pressure gradient and directly relates the zonal wind speed to the mesospheric temperature field. VIRTIS (Visible and Infrared Thermal Imaging Spectrometer) on board Venus Express satellite has been investigating for two years Venus atmosphere mainly in the southern hemisphere and is providing new observations of the mesospheric temperature structure with a very good spatial and temporal coverage. Here we present cyclostrophic winds derived from the VIRTIS temperature sounding. The thermal wind field is characterized by a strong jet centered at 50° latitude and 67 km altitude with peak velocity of 95 m/s, associated with the cold collar region. At high latitudes (> 70°) thermal wind quickly fades out with altitude. Parameters of the mid-latitude jet only weakly depend on local solar time. Cyclostrophic wind shows satisfactory agreement with the cloud-tracked winds derived from the Venus Monitoring Camera UV images. Similarity of the VIRTIS thermal wind field to that derived earlier (Zasova et al., 1997) in the Northern hemisphere indicates global symmetry of the circulation pattern.