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Characterization of the Venusian atmospheric dynamics with ground-based Doppler velocimetry

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Abstract

With the aim of characterizing the zonal wind flow in the atmosphere of Venus during the nominal mission phase of Venus Express, we have made coordinated observations at the VLT in May and June 2007. The UVES instrument, mounted on the UT2 telescope has been used, simultaneously achieving high spectral resolving power and high spatial resolution. In one observation block the field has been derotated in order to align the 0.3-arcsec aperture perpendicularly to Venus's rotation axis, while in other observations it was aligned parallel to it. In each case, spatial information, respectively in the East-West and in the North-South direction, is preserved in the spectra in the direction perpendicular to dispersion, allowing to spatially resolve relative variations in atmospheric rotation. The observations were made at a central wavelength of 580 nm with the UVES red arm and at 437 and 860 nm in dichroic mode, using both the blue and red arms. We shall present measurements of zonal winds obtained with the technique of Doppler velocimetry, applied to the visible solar Fraunhofer spectrum reflected at the cloud tops in the day side, probing the region close to 65 km altitude.

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