

# Temporal Evolution of the Venusian Atmospheric Superrotation Measured in the Venus Express Venus Monitoring Camera Data

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We present wind measurements of Venus using images captured between 2006 and 2014 using the ultraviolet filter of the Venus Monitoring Camera (VMC) onboard the Venus Express (VEx) spacecraft. We have developed a method to automatically match image pairs suitable for tracking cloud features to perform wind measurements using the Correlation Imaging Velocimetry (CIV) method. Our automated pair matching algorithm identified ~35,000 usable images captured during the ~2300 orbits around Venus, in which we found approximately 350,000 usable image pairs (i.e., each of the images could be paired with 10 other images on average). To date, we have analyzed ~10% of these image pairs, and computed 55 million wind vectors.

Our measurements so far have enabled us to analyze orbit-by-orbit changes in the zonal wind speeds in the southern hemisphere of Venus. We do not analyze the northern hemisphere because the VMC images do not provide consistent spatial coverage in the north. Our preliminary analysis reveals temporal evolution in the superrotation speed on Venus that shows that the wind speed fluctuated by 20 m/s between 2006 and 2014. Our result so far is comparable to the changes detected by Khatuntsev et al. (2013) and Kouyama et al. (2013) using VMC images, and Hueso et al. (2015) using VIRTIS data. Our study extends these results to detect temporal change in the wind over shorter timescales, and aims to link those changes to any transient event that may have affected the dynamics.

Keywords: Venus, Venus Express, Wind Measurements