**OBSERVATIONAL ANALYSIS OF VENUSIAN ATMOSPHERIC EQUATORIAL WAVES AND SUPERROTATION.** R. M. McCabe[1], K. M. Sayanagi[1], J. J. Blalock[1], J. L. Gunnarson[1], J. Peralta[2], C. L. Gray[3], K. McGouldrick[4], T. Imamura[2], and S. Watanabe[5], [1]Atmospheric and Planetary Sciences, Hampton University, 23 E Tyler Street, Hampton, VA 23661 (rymccabe999@aol.com), [2]Institude of Space and Aeronautical Sciences, JAXA, [3]Apache Point Observatory, Sunspot, NM, [4]Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, [5]Earth and Planetary Science Department, Hokkaido University.

**Introduction:** We investigate the dynamics of Venus's atmosphere in an attempt to link variability of atmospheric superrotation to the existence and occurrences of the Y-feature seen at ~365 nm, representing an altitude of ~65 km. The atmospheric superrotation, in which the equatorial atmosphere rotates with a period of approximately 4-5 days (~60 times faster than the solid planet), has forcing and maintenance mechanisms that remain to be explained. Temporal evolution of the zonal wind could reveal energy and momentum transport in or out of the equatorial region and shed light on mechanisms that maintain the superrotation. We postulate that the Y-feature is a manifestation of equatorial waves (Kelvin, Rossby, or a combination of the two) [2,5,6] that may play a role in such energy transport that could affect superrotation. To understand the connection between the Y-feature and the superrotation, we must determine the frequency of Y-feature existence, the variability of the atmospheric wind field, and analyze the connection between the two to determine to what extent the Y-feature plays a role in Venus's superrotation.

**Results:** We characterize the total and annual zonal mean wind fields of Venus between 2006 and 2013 in ultraviolet images captured by the Venus Monitoring Camera on board the ESA Venus Express (VEX) spacecraft which observed Venus's southern hemisphere. Our measurements show that, between 2006 and 2013, the westward wind speed at mid- to equatorial latitudes exhibit an increase of ~20 m/s, similar to that of previous measurements [4]. We additionally examine wind speed dependencies on both longitude and local time. There is a longitudinal variation at mid- to equatorial latitudes of about 15-20 m/s and a local time variation in similar latitude ranges of about ~20-25 m/s, similar to past measurements [1,3]. We also conduct ground-based observations, concurrent to observations by the Japanese spacecraft Akatsuki, with the 3.5 m ARC telescope at the Apache Point Observatory (APO) in Sunspot, NM to extend our temporal coverage to present. Images captured at APO to date demonstrate that it is possible to see large features that could be used to confirm the Y-feature existence to later be compared to future wind analyses of Akatsuki images. The viability of tracking the existence of the Y-feature during VEX and Akatsuki is discussed and the analysis of such occurrences and wind field variability is ongoing.

**References:** [1] J. L. Bertaux, et al. (2016) *JGR: Planets, 121(6)*, 1087-1101. [2] A. D. del Genio and W. B. Rossow. (1990) *J. Atmos. Sci., 47*, 293-318. [3] R. Hueso, et al. (2015) *Planet. and Space Sci., 113*, 78-99. [4] I. V. Khatuntsev, M. V. Patsaeva, et al. (2013) *Icarus, 226*, 140-158. [5] T. Kouyama, et al. (2015) *Icarus, 248*, 560-568. [6] J. Peralta, et al. (2015) *Geo. Research Letters, 42*, 705-711.