

Cloud Tracking in the Polar Region using Rotation Invariant Phase Only Correlation

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In the ultraviolet range, Venus shows various cloud patterns due to the absorption by an “unknown” absorber, and wind velocities can be measured by tracking these patterns in ultraviolet images obtained sequentially. In previous cloud tracking studies, equirectangular projection images have mostly been used (Limaye, 2007; Kouyama et al. 2013); however, the cloud pattern in the high latitude tends to be stretched in the east-west direction in equirectangular projection, making the tracking of small-scale features difficult. In this study, we apply cloud tracking to Venus images in the polar region with polar projection and using the rotation invariant phase correlation method to account for the rotation of the image around the pole. The data used are 365 nm images taken by UVI onboard JAXA’ Akatsuki. Initial results show sporadic occurrence of high-latitude jets that are faster than the average wind speed derived from the ultraviolet images taken by VIRTIS by Hueso et al. (2015) in the latitude of 50-70 degrees.

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