回転不変位相相関限定法を用いた金星極域の雲追跡

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Cloud tracking in the Venusian polar region using Rotation Invariant Phase Only Correlation

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The atmospheric circulation and the associated material transport in the Venusian polar region are thought to be crucial for the maintenance of the global cloud/atmospheric structure. In the ultraviolet range, Venusian cloud shows various patterns created by the transport of ””unknown”” UV absorber, which can provide information both on dynamics and chemistry in this region. Wind velocities have been measured by cloud tracking using images obtained sequentially in such ultraviolet range with Galileo, Venus Express and Akatsuki, using polar projections to avoid the geometrical distortion that high-latitude features present when using equirectangular projections. However, tracking cloud patterns on polar projections presents an additional difficulty due to the need of accounting for the changes in the orientation of the cloud patterns experiencing zonal displacements. In this study, we apply cloud tracking to the polar region in polar projections by using the ””rotation invariant phase only correlation method”” considering the rotation of the cloud patterns. The derived velocity field is compared with the cloud morphology to understand the role of dynamics in shaping the clouds. The data used are 365 nm images taken by UVI onboard JAXA’ Akatsuki. We also derive rotational components from the rotation angle of the image and examine the difference between rotational component obtained from the wind field and obtained from the rotation angle of the image.