R009-P25
ポスター 2 ：9/25　AM1/AM2 （9:00-12:30）

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Image analysis of the polar vortices of Venus observed by Akatsuki/LIR

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Atmospheric temperature at the cloud tops of Venus around an altitude of 65 km decreases with latitude, but it is known that there are high-temperature regions near the poles and cooler regions around them. The high-temperature regions rotate around the poles, and called as the polar vortices, where zonal wavenumber 0, 1 and 2 shapes of the temperature distribution predominate [Garate-Lopez et al., 2013; Sato et al., 2014]. Previous studies have derived a rotation period of about -2.8 to -3.2 days and about -2.2 to -2.5 days for the northern and southern polar vortices, respectively, but the cause of the difference in the rotation periods of the northern and southern polar vortices is unknown [Schofield et al., 1983; Garate-Lopez et al., 2013]. There are also few observational investigations of the relationship between the atmospheric dynamics in mid- and low-latitudes and the thermal structure of the polar regions. A long-term variation of the polar phenomena has not yet been investigated.

The Venus orbiter Akatsuki has been orbiting around Venus since December 2015. Longwave Infrared Camera (LIR) is one of the cameras onboard Akatsuki, still obtaining images of brightness temperature around the cloud-top altitudes every day as of June 2023. Since Akatsuki is orbiting in an almost equatorial plane, LIR can capture both northern and southern polar vortices from a far distance in the elongated elliptical orbit. In this study, the dynamics of the polar vortices is studied by analyzing LIR data obtained from December 7, 2015 to June 17, 2023. Periods and center positions of the rotation of the polar vortices were derived. The derived values may contain biases due to lack of brightness temperature distributions in the region where LIR cannot observe. The errors in the derivation were evaluated by simulation in which an image data that simulate the brightness temperature distribution obtained by LIR was created from an infrared image data obtained by VEx/VIRTIS and analyzed using the same method. The results were compared with the periods and center positions derived from the full images of the polar vortex. Comparison of the periods and center positions of northern and southern polar vortices and their long-term variation are discussed.