[EE] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS04]Results from Akatsuki and advances in Venus science

convener:Takehiko Satoh(Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency), Takeshi Horinouchi(Faculty of Environmental Earth Science, Hokkaido University), Masaru Yamamoto(九州大学応用力学研究所, 共同), Kevin McGouldrick(University of Colorado Boulder)
Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
More than two earth years in Venus orbit, Akatsuki has acquired a volume of high-quality data, unveiled many new phenomena and is allowing researchers to investigate the underlying mechanisms. As the data accumulate, numerical models and theories are being advanced as well. We are no doubt living in the new golden era of Venus studies. This session invites papers of the new scientific results with Akatsuki data and the latest results of theoretical and numerical works. We expect participants of this session share the latest research results through presentations and discussion.

[PPS04-P13]Local-time dependence of the cloud-top Temperature of Venus obtained by close-up observations of LIR on board Akatsuki

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The Long-wave infrared camera (LIR) on board Akatsuki detects thermal infrared radiation at wavelengths of 8–12 µm from cloud-top level (65 km) of Venus in order to provide brightness temperature map. LIR has mainly obtained Venus disk images with more than 50,000 km distance along Akatsuki's elliptical orbit. Meanwhile, 500 sheets of close-up images at equatorial region were obtained with high spatial resolution. In this study, temperature deviations were derived from the close-up images in latitude from 30 to -30 degree. After that, zonal wavenumber spectra of the temperature deviation at mesoscales (wavelengths of 20–1000 km) were obtained in 5 degrees step of latitude as a function of local time (LT). The result shows that the temperature deviation is obviously high in LT 14:00–18:00, and the spectral peak corresponds to the wavelengths of 500 km. The temperature deviation would be caused by the stationary gravity wave discovered by LIR initial observation (Fukuhara et al., 2014, Nature Geo). We could detect the stationary gravity wave in the LIR image not only in the Venus disk image but also in the close-up image. Another high temperature deviation is seen in LT ~23:00, and the spectral peak corresponds to the wavelengths of ~150 km. A numerical simulation (Imamura et al., 2014, Icarus) has predicted that temperature deviation at the cloud-top level can be caused by upward propagation of the gravity wave, which is generated by the convection in the cloud layer of the night-side of the equatorial region. Our result can support existence of such upward propagation of the gravity wave in the cloud level of Venus.