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Renewed science plan of AKATSUKI

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The main goal of the Japanese Venus orbiter Akatsuki is to understand the Venusian atmospheric dynamics and cloud physics, with the explorations of the ground surface also being a theme. Onboard science instruments, five of which are imagers dedicated to meteorological studies and one of which is a reference radio source, sense multiple height levels of the atmosphere to model the three-dimensional structure and dynamics. The lower clouds, the lower atmosphere and the surface are imaged by utilizing near-infrared windows. The cloud top structure is mapped by using scattered ultraviolet radiation and thermal infrared radiation. Lightning discharge is searched for by high speed sampling of lightning flashes. Night airglow is observed at visible wavelengths. Radio occultation complements the imaging observations by determining the vertical structure of the atmosphere.

Although the arrival of Akatsuki at Venus was postponed for several years due to a malfunction of the propulsion system during the first Venus orbit insertion on December 7, 2010, the observation strategy mentioned above will be basically unchanged. The science instruments will be kept in conditions appropriate for long-term survival. Nevertheless, we are considering a further optimization of the observation plan based on the achievements made by ESA's Venus Express. Venus Express covers a broad range of sciences including atmospheric chemistry, atmospheric dynamics, surface processes and plasma environment. The spectroscopic information on clouds, the dynamical features of the polar region, and the mesoscale features seen in close-up images captured by Venus Express help us to improve Akatsuki's meteorological observation and data analysis.