AOGS 2006

Ground-Based Observations of Venus

MUNETAKA UENO[1], SHOKO OHTSUKI[1], HIDEO SAGAWA[1],
KAZUAKI MITSUYAMA[1], YASUMASA KASABA[2],
MASATO NAKAMURA[2], TAKESHI IMAMURA[2]

[1] *University of Tokyo*

[2] *Japan Aerospace Exploration Agency*

Venus, a neighbor planet of the Earth, is one of the most exploited planets both with space-borne and ground-based observations, and its atmospheric environment has been appreciably revealed as a quite differentiated one from that of the Earth. There are many important questions waiting for further meteorological study due to the lack of information of the Venusian middle atmosphere, which plays a key part of the Venusian meteorology, where more than 70% of the solar energy is deposited and the thick clouds of H2SO4 aerosol exist. Among them are the nature of meso-scale convection systems that maintain the main cloud deck, and the hierarchical dynamical system that supplies energy to the planet-encircling gravest mode, the super-rotation. It is also important to detect small-scale cloud/chemical structures and their temporal variations, and relate them with larger-scale fields. We are conducting extended observations of Venus using ground-based telescopes; SUBARU, IRTF. Middle infrared (10-20um) imaging observations were carried out at SUBARU observatory to determine accurate temperature at the high altitude. Assuming that the observing altitude represents the isobaric level, the temperature variations are interpreted as the amplitude and the periodicity of the atmospheric waves. Previous studies derived from the spectroscopic observations by Pioneer Venus and Venera-15 spacecraft showed the atmospheric wave including several components of different wave numbers, however, the local times of the samples were very limited and their spatial resolutions were only up to 500 km. These conditions restricted the identification of each wave component. Near infrared spectroscopic observations were done at NASA/IRTF. Observations of airglow can provide lots of information on the dynamics and chemistry of the upper atmosphere. The atmospheric emission processes of other planets were studied by analogy with those in the Earth atmosphere and seem to be different at all. The airglow in the Venus atmosphere is still hidden in her veil. The observations will provide the 2-D distribution of the temperature in the emitting layer together with the fine structure of the emission rate, thereby revealing the dynamics governing the subsolar-to-antisolar flow which may prevail in the Venusian thermosphere.