Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

PCG31-P02 Room:Convention Hall Time:May 23 18:15-19:30

Study of the Venus cloud upper haze

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Venus is covered by H_2SO_4 clouds floating at 45-90 km. Despite Venus cloud is identified by previous Venus observation, there are many unknown things about Venus cloud because of small number of Venus observations. Moreover, knowledge of Venus cloud upper haze layer(70-90 km) is less than upper, middle and lower cloud remarkably because most of Venus probes observed only below the upper cloud layer (under 70km).

Solar Occultation at Infrared(SOIR), which is a part of the spectroscopy on board Venus Express, is designed to measure at high resolution the atmospheric transmission in the IR (2.2-4.3 um) using solar occultations. SOIR observe Venus atmosphere and cloud existed at high altitude (60-220 km), any latitude and longitude. In this study, analysis of SOIR data obtained between 2006 and 2009 is performed to obtain knowledge of Venus cloud upper haze layer.

Altitude distribution and time variation of upper haze extinction and mixing ratio are derived from SOIR data. Mixing ratio vertical distribution shows that haze creation is more dominant than vertical eddy diffusion at above 90 km. It is speculated that sulfide is contained in haze from comparison of this study and mixing ratio vertical distribution of SO/SO_2. Mixing ratio vertical distribution shows that vertical eddy diffusion is more dominant than haze creation at 70-90 km. It is speculated that sulfide is contained in haze from comparison of this study and time variation and latitude distribution of SO/SO_2.

Keywords: Venus, cloud, Venus Express, SOIR