

The study of Venus transit for the extinction in the atmosphere of Venus and the plan for limb imaging by Akatsuki

KANAO, Miho^{1*} ; NAKAMURA, Masato¹ ; SHIMIZU, Toshifumi¹ ; OHTSUKI, Shoko² ; IMAMURA, Takeshi¹

¹JAXA/ISAS, ²Senshu University

The study for the limb arc radiation from the solar photosphere observed during the transit of Venus will be reported following SGEPS meeting in 2014. The occulted flux observed by SOT is determined from some parameters; the solar flux, the refraction angle through the atmosphere of Venus, and the extinction by the atmosphere.

The solar flux is determined as the average un-occulted solar flux from the photosphere. The solid angle for the flux must change by the focusing effect and the spread due to the refraction angle gradient to the altitude. The refraction angle to the encountering solar radiation is calculated.

The flux in the atmosphere of Venus is decreased by the extinction due to the absorption and scattering by the molecular and the scattering by the cloud particles and the haze. The phase function of the Mie scattering for the cloud particles shows the strong forward peak. When the source function for the radiative-transfer equation is supposed to 0, the extinction due to the cloud particles could be derived from the Beer's law. Our goal is the accuracy on determining the number density of the cloud particles is better than 10 km and 1/cc in the atmosphere of Venus. The observation wavelength is 388.3 nm.

Akatsuki is planned to be inserted into Venus orbit in this year. We will be able to take images capturing the limb of Venus around the apoapsis. The plan to obtain the three-dimensional map of the cloud particles and the haze will be discussed.

Keywords: The atmosphere of Venus, Hinode, The solar occultation, Akatsuki, Aerosol