Observation plan of Venus cloud tops with new developed fiber IFU

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Venus is covered with thick clouds made of sulfuric acid on the whole planet, and in visible light it has poor features like ping-pong balls. On the other hand, in ultraviolet light of the wavelength from 200 to 500 nm, it has clear features showing high speed wind blowing so called "super rotation". From 200 nm to 320 nm, absorption can be well explained by SO2 existence, but absorber have not yet identified at wavelengths longer than 320 nm. Although previous observations were carried out by using only one band with a center wavelength of 365 nm, it may be possible to clarify the nature and number of this unknown absorber by comparing the difference of the spatial structure between different wavelengths. Ultraviolet camera (UVI) mounted on Akatsuki has continued to take two different band images with wavelengths of 283 nm and 365 nm, and there are clear spatial structure difference in two bands. Since the band width of UVI is about 15 nm, it is not possible to know what kind of change is occurring between two wavelengths of UVI. The purpose of this study is to clear that from what wavelength the difference exists.

We are developing a spectrum imaging instrument using fiber array. Spectrum imaging can take several images of different wavelength at same time, and it is suitable for studying the unknown UV absorber of Venus. We thought a new manufacturing method of a fiber array with several hundred of fiber with diameter of ~100μm, and improvement has been added to the method for practical use.

In this presentation, we will report 1) the new method of tracing each fiber in the fiber array, 2) performance of our instrument and 3) plan to observation of Venus using the fiber array are designed for Haleakala 60-cm.

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