

SUBARU Infrared Spectroscopy of the Pluto

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Pluto is a strange/odd/mysterious planet which has a diameter of only 2274km (1/6 of that of the Earth), separation of 39.5AU from the Sun and over 17 degrees of orbital inclination. For that reason, Pluto is lately seen as one of the largest EKOs. Therefore investigation of Pluto's surface composition using SUBARU Telescope has much importance in revealing the origin of the EKOs and thermal history of the outer solar system.

In 1999, the absorption bands of solid ethane were confirmed in the spectroscopy of Pluto-Charon system conducted in the K-band (1.93-2.48 μ m) using SUBARU Telescope with CISCO (Nakamura et al., 2000). Ethane is not likely to be formed in the equilibrium condensation model of the solar system. Instead Pluto's ethane is thought to be a product of photochemical reaction or a presolar material originated in the comets bombarded on Pluto. The spectroscopic study of Pluto is important also because ethane to methane ratio gives clues in revealing the volatilization/recondensation process in the protoplanetary disk.

However, because of ethane's weak absorption in the K-band, objection arises to its existence. Therefore observation in another band is critical in confirming the presence of solid ethane. Here we will present the spectroscopic data obtained in the L-band (2.84-4.16 μ m) using SUBARU Telescope/IRCS in 2002 and will reexamine the presence of ethane on Pluto. No previous work has been done on the distribution of ethane on Pluto through L-band. We would like to present the significance of SUBARU Telescope in the field of planetary science.