

Initial Result of Millimeter Waveband Observations toward the Newly-discovered Comet, C/2011 L4(PANSTARRS)

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Revealing the chemical abundances of comet is crucial for study of the planetary formation process. C/2011 L4 (PanSTARRS) is a good target to address the chemical abundance ratio of cometary composition since the heliocentric distance at perihelion is predicted to be as close as 0.3 AU from the Sun, three times closer than the case of comet Hale-Bopp. We conducted multi-epoch line-survey observation toward C/2011 L4 (PanSTARRS). Highly sensitive observations with wide spectral coverage realized by TZ receiver and SAM45 spectrometer on-board Nobeyama 45-m telescope of NAOJ make it possible to observe many representative volatile gases such as HCN, HNC, SO, CS, NS, CH₃CN, CH₃OH, simultaneously. Observation period are from March to April 2013 with total 20 hours observation time in three epochs. Initial result of this observation campaign will be presented.

Keywords: comet, radio astronomy

$^{40}\text{Ar}/^{39}\text{Ar}$ method using cosmogenic ^{39}Ar

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Finding of ^{39}Ar of cosmogenic origin in meteorites was one of cues for developing $^{40}\text{Ar}/^{39}\text{Ar}$ method. If the production rate of ^{39}Ar is uniform, and if a long enough period elapses, the production and decay of ^{39}Ar reach to equilibrium since ^{39}Ar has a half life of 293 years. Eventually a rock or a mineral possesses a certain amount of ^{39}Ar depending on its potassium content. Using samples under the same exposure to cosmic ray, and determining an age of a sample, $^{40}\text{Ar}/^{39}\text{Ar}$ method can be applicable to the rest of unknowns. One of such possibilities may be to apply to samples on the lunar surface. No need for atmospheric contamination and ^{36}Ar measurement, and the application may be easier than that on the earth's surface. However, the method cannot be applied to samples in some depth or with different exposure histories.

Keywords: ^{39}Ar , cosmogenic, $^{40}\text{Ar}/^{39}\text{Ar}$ age, lunar surface, in situ measurement