[JJ] Evening Poster | P (Space and Planetary Sciences) | P-CG Complex & General

[P-CG22]New Developments of Planetary Sciences with ALMA

convener:Takayuki Muto(Division of Liberal Arts, Kogakuin University), Munetake Momose(The College of Science, Ibaraki University), Hideo Sagawa(京都産業大学理学部, 共同), Masumi Shimojo(National Astronomical Observatory of Japan)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
The Atacama Large Millimeter/Submillimeter Array (ALMA) starated its science operation in 2011, and long-baseline observations have become available since 2014. ALMA, with its high sensitivity and resolution, has provided us with qualitatively new information on star and planet formation and small bodies in our Solar System. For example, the discovery of narrow gap structures in the protoplanetary disks around young stars HL Tan and TW Hya enabled us to actually compare the long-standing theoretical models of planet formation with real observations. In our solar system, 60km pixel-scale non-uniform brightness distribution and the rotation of the asteroid Juno are detected. Spatially-resolved thermal mapping of Europa icy surface enables us to search for thermal anomaly in possible plume source regions. As of Cycle 4, Solar observations are available, enabling us, for example, to determine the physical parameters of plasmoid quantitatively. In this session, we overview the latest results of ALMA observations in the field of planetary sciences. We also accept any theoretical and experimental works that are closely related to the observations and discuss the impact on the planetary science community.

[PCG22-P05]On the spatial distribution of Neptune's stratospheric HCN obtained with ALMA

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Keywords:ALMA, Planetary atmosphere, Neptune

We present spatially resolved hydrogen cyanide (HCN) (J=4--3) molecular emission spectra and its three-dimensitonal distribution in the Neptune's stratosphere.
We analyzed a data obtained from the archive of the Atacama Large Millimeter-submillimeter Array (ALMA) observed with a band-7 receiver(Project ID: 2015.1.01471.S).
Synthesized beam size was 0.42 x 0.38 arcsec, synthesized beam is fine enough to resolve Neptune's 2.24 arcsec diameter disk.
The integrated intensity map of HCN shows a latitudinal gradient that has highest and lowest peak at the equator and 60S, respectively.
Radiative transfer analysis showed that column densities measures at the equator shows 1.5 times higher value than that of measured at 60S.
The derived HCN spatial distribution is consistent with the previously proposed stratospheric global circulation, which has upwelling and downwelling at 60S and the equator, respectively.