

On the spatial distribution of Neptune's stratospheric HCN obtained with ALMA

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We present spatially resolved hydrogen cyanide (HCN) ($J=4-3$) molecular emission spectra and its three-dimensional 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 0.42×0.38 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 measured 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.

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