

ALMAアーカイブデータ解析によるTitan大気中のCH<sub>3</sub>CNの鉛直分布The vertical distribution of CH<sub>3</sub>CN in Titan's atmosphere by the ALMA archive data analysis\*仲本 悟<sup>1</sup>、平原 靖大<sup>1</sup>、飯野 孝浩<sup>2</sup>、中山 勇麻<sup>3</sup>\*Satoru Nakamoto<sup>1</sup>, Yasuhiro Hirahara<sup>1</sup>, Takahiro IINO<sup>2</sup>, Yuma Nakayama<sup>3</sup>

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We report the analysis of CH<sub>3</sub>CN (methyl cyanide) in Titan's atmosphere using the Atacama Large Millimeter/submillimeter Array (ALMA) archive data ranging from 275 to 350 GHz. We developed a radiative transfer code for the multiple emission lines of CH<sub>3</sub>CN in spherically symmetric distribution within the synthetic beamshape of ALMA, and derived the optimized vertical abundance profile for CH<sub>3</sub>CN by the fittings of spectral line shapes. It was found that the abundance of CH<sub>3</sub>CN readily increases around 200 km altitude, and then decreases along with the higher altitude. This result disagrees with various photochemical calculations for Titan's atmosphere, showing that the mole fraction of CH<sub>3</sub>CN has a peak around 1000 km altitude. In contrast, our result is in reasonable accordance with that observed by the Cassini/Composite Infrared Spectrometer (CIRS) for the vertical distribution of HCN, which is as stable as CH<sub>3</sub>CN from a chemical point of view. Our results also suggest the effect of Titan's atmospheric dynamics and seasonal change on the vertical profile of CH<sub>3</sub>CN.

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