P321a　アルマアーカイブの悉皆解析による，タイタン大気におけるシアノジアセチレン (HC_5N) 分子の徹底探索

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Atmospheric composition of Titan is characterized by the presence of complex nitriles and haze layers, and relating atmospheric chemistry. Nitriles condensed or accreted on haze particle undergo photochemical reactions to form complex polymers, including prebiotic molecules. Among them, photochemical reactions involving Cyanodiacetylene (HC_5N) are important as reaction pathway that lead to the production of amines and aromatic molecules. While HC_5N is detected already in the ionosphere of Titan by the Cassini spacecraft, in the middle and lower atmosphere, where haze layers are present, only an upper limit abundance was obtained by a previous search. We have carried out a new comprehensive search of HC_5N on Titan's atmosphere using 200 GHz band spectroscopic archival data of the ALMA. To detect a faint spectral line of HC_5N, a spectral stacking method, which integrate different transition data, was employed. Integrating 28 independent observation data, an emission spectrum of HC_5N was obtained with $\sim$4–σ significance. Using the radiative transfer analysis, employing the most plausible vertical distribution, the column density of HC_5N was derived to be 0.9% of middle atmospheric HC_3N, the shortest cyanopolyyne. Since the employed profile locates at the altitude where haze particle growth occurs, the result may lead to the incorporation of HC_5N onto haze particle and resulted production of complex molecules.