THE SUB-MILLIMETER WAVE SPECTROSCOPY OF MONODUTERATED AMIDOGEN RADICAL (NHD)

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The amidogen radical, NH_2 is one of the basically significant triatomic molecules in molecular spectroscopy and interstellar chemistry, quantum chemistry and so on. In 1990s, the NH_2 radical was detected in Sgr B2.[a] The monoduterated species, NHD radical, could be observed in interstellar clouds in the future. Since NHD is light molecule, the important transitions appear in the terahertz region. However, pervious report is limited to about 500 GHz. [b]

In this study, the pure rotational spectrum of NHD radical in the ground state ($\tilde{X}^2A''$) was observed in sub-millimeter wave region by frequency modulated sub-millimeter wave spectrometer at Toho University. This radical were produced by a DC-glow discharge through NH_3 and D_2 mixture at around 220K. So far, $7_{2,6}$-$6_{3,3}$ and $3_{1,2}$-$3_{0,3}$ of NHD lines were measured. We plan to measure terahertz transitions and report its analysis.

[a] E. F. Van Dishoeck, D. J. Jansen, P. Schilke, and T. G. Phillips, *ApJ*, **416**, 183 (1993).

[b] K. Kobayashi et al., *J. Chem. Phys.*, **107**, 22 (1997).