OBSERVATION OF A PLANAR ISOMER OF THE N_2O-$(C_2H_2)_2$ TRIMER

S. SHEYBANI-DELOUI, J. NOROOZ OLIAEE, M. REZAEI, N. MOAZZEN-AHMADI, *Department of Physics and Astronomy, University of Calgary, 2500 University Drive North West, Calgary, Alberta, Canada T2N 1N4*; A.R.W. McKELLAR, *National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6*.

Infrared spectra of a planar isomer of the N_2O-$(C_2H_2)_2$ are observed in the region of ν_1 fundamental band of N_2O monomer ($\sim$2224 cm^{-1}) using a quantum cascade laser to probe a pulsed supersonic slit jet expansion. The band is simulated by an asymmetric top Hamiltonian with rotational constants of $A = 2871$ MHz, $B = 1140$ MHz, $C = 816$ MHz and hybrid a/b-type transitions. It shows a relatively large blue-shift of about 9 cm^{-1} with respect to the N_2O monomer band origin. In addition to the normal istopologue, $^{15}N_2O$-$(C_2H_2)_2$ and N_2O-$(C_2D_2)_2$ are also observed. Here, we present our observation and experimental results which agree fairly well with a semi-empirical calculation which indicates that the lowest energy isomer has a planar structure very similar to that of OCS-$(C_2H_2)_2$.[a]

[a] J. Norooz Oliaee, A.R.W. McKellar, and N. Moazzen-Ahmadi, *Chem. Phys. Lett.* **512**, 167 (2011).