

THE SECOND RESONANCE SYSTEM OF HC₃N. NEW RO-VIBRATIONAL GLOBAL ANALYSIS FOR ALL THE EXCITED STATES BELOW 1300 cm⁻¹.

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The ro-vibrational spectrum of HC₃N has been recently the object of a comprehensive study^a which put together new high-resolution mid-infrared measurements and all existing rotational data for the vibrationally excited states located below ~ 1000 cm⁻¹. The resulting global analysis yielded accurate and physically sound spectroscopic parameters for 12 states, thanks to the careful treatment of the *l*-type resonance effects in bending states and the consideration of various anharmonic resonances, in particular those connecting the polyad of states $v_4 = 1$, $v_6 = 2$, $v_5 = v_7 = 1$, and $v_7 = 4$. Here, the extension of the study to the second polyad of interacting states is presented, they are: $v_4 = v_7 = 1$, ($v_6 = 2$, $v_7 = 1$), ($v_5 = 1$, $v_7 = 2$), and $v_7 = 5$, and are located in the energy interval 1100–1300 cm⁻¹. New far- and mid-infrared spectra have been recorded at SOLEIL, with a resolution of 0.001 cm⁻¹, and further measurements of the millimeter and sub-millimeter spectra of the four interacting states have been performed at Garching and Bologna. The results of a new global analysis including all the states below ~ 1300 cm⁻¹ are presented and discussed.

^aL. Bizzocchi, F. Tamassia, et al., *Astroph. J. Supp. Ser.* 233:11, 2017