

# SPECTROSCOPIC STUDY AND ASTRONOMICAL DETECTION OF VIBRATIONALLY EXCITED *n*-PROPYL CYANIDE

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We have obtained ALMA data of Sagittarius (Sgr for short) B2(N) between 84.0 and 114.4 GHz in its Early Science Cycles 0 and 1. We have focused our analyses on the northern, secondary hot molecular core Sgr B2(N2) because of the smaller line widths. The survey led to the first detection of a branched alkyl compound, *iso*-propyl cyanide, *i*-C<sub>3</sub>H<sub>7</sub>CN, in space<sup>a</sup> besides the  $\sim 2.5$  times more abundant straight chain isomer *n*-propyl cyanide, a molecule which we had detected in our IRAM 30 m survey.<sup>b</sup> We suspected to be able to detect *n*-propyl cyanide in vibrationally excited states in our ALMA data.

We have recorded laboratory rotational spectra of this molecule in three large frequency regions and identified several excited vibrational states. The analyses of these spectra have focused on the 36 to 70 GHz and 89 to 127 GHz regions and on the four lowest excited vibrational states of both the lower lying *gauche*- and the slightly higher lying *anti*-conformer for which rotational constants had been published.<sup>c</sup> We will present results of our laboratory spectroscopic investigations and will report on the detection of these states toward Sgr B2(N2).

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<sup>a</sup>A. Belloche et al., *Science* **345** (2014) 1584.

<sup>b</sup>A. Belloche et al., *A&A* **499** (2009) 215.

<sup>c</sup>E. Hirota, *J. Chem. Phys.* **37** (1962) 2918.