

HNCO in the Galactic center

Group – B

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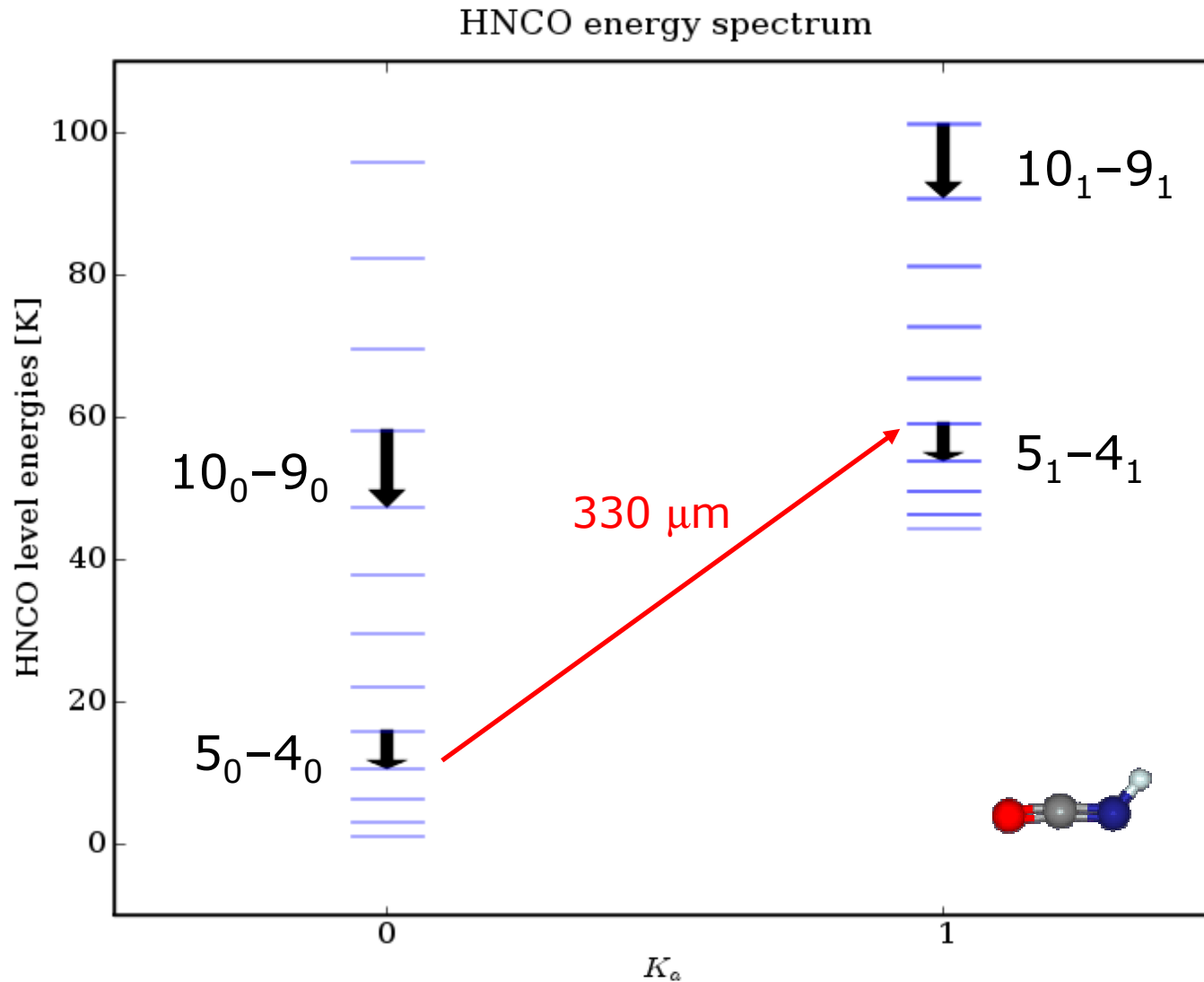
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Why HNC0 ?

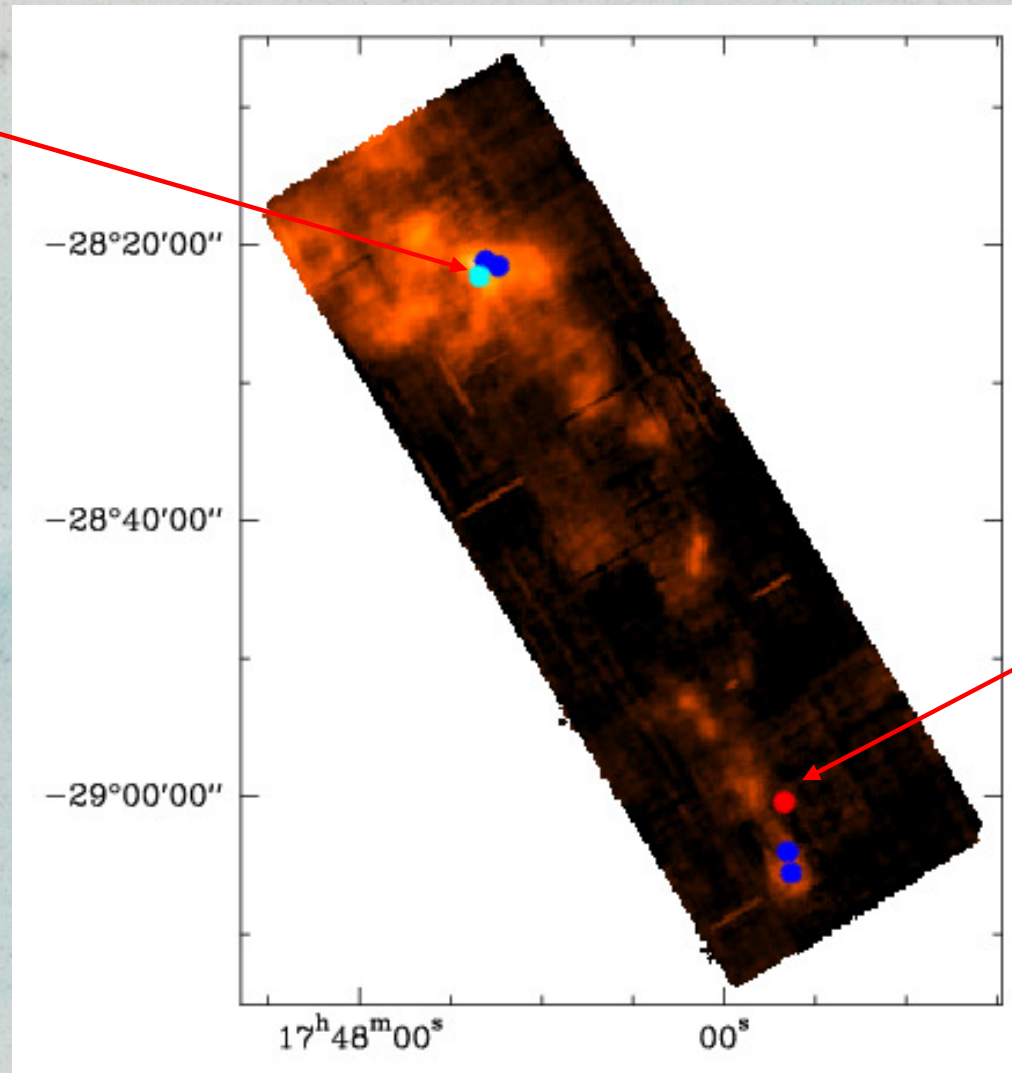
- HNC0 has particular efficient transitions between the K ladders.
- H₂ densities below 10⁶ cm⁻³ are not enough for collisions to keep up with radiative decay.
- Thus, radiative processes (for T_{rad} > 10 K) are the dominant process for excitation of the molecule (e.g. 330 μm from the K=0 to K=1 ladder).
- THUS we can use HNC0 to infer the temperature of the apparent radiation field!

Energy Levels of HNCO



Map of HNCO in the Galactic center

Sgr B2



Sgr A

Mopra @ 87 GHz

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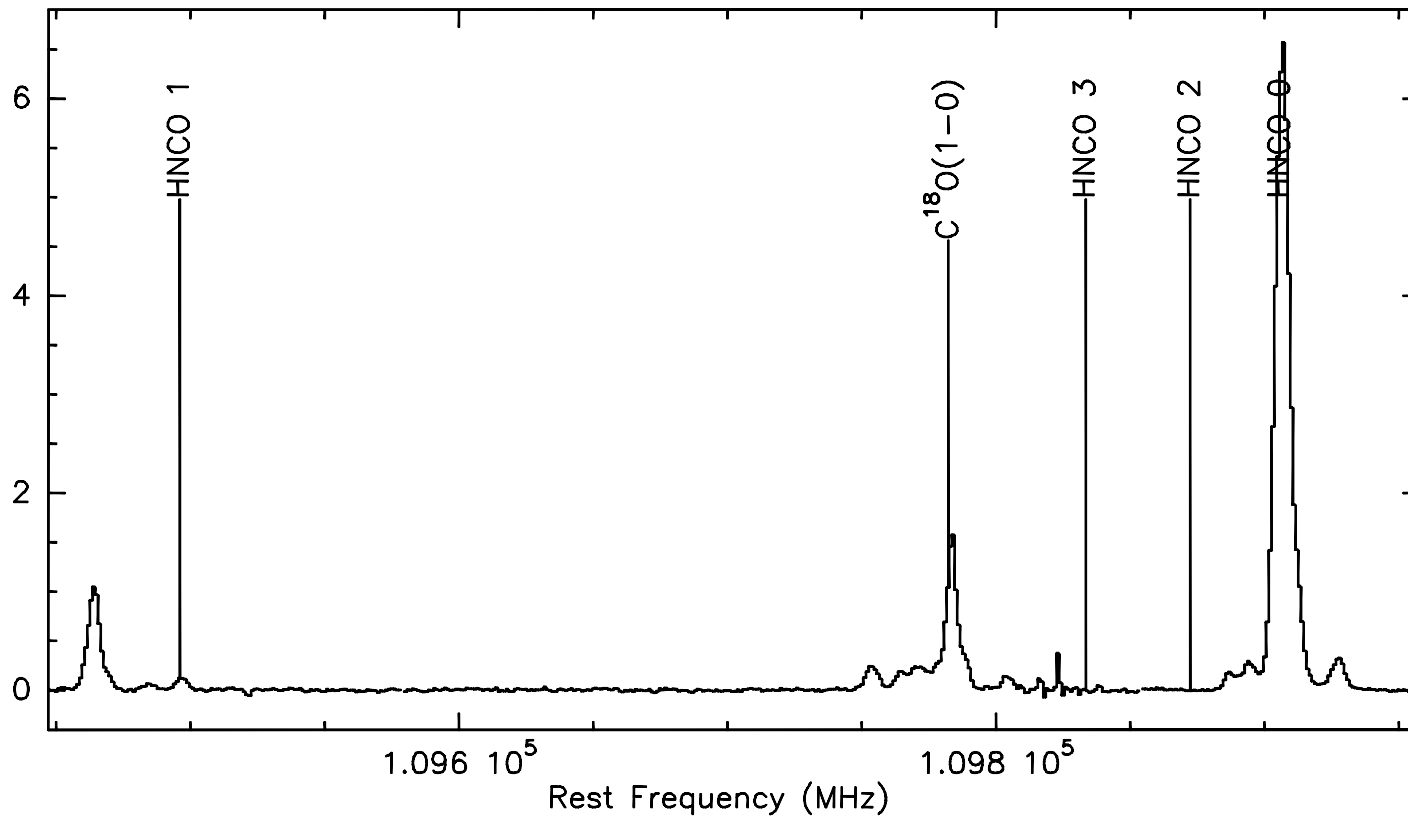
Observations

- Observation time at the 30m on 29.9.07
- Position switch mode
- Backends: 1 MHz / 4 MHz Filterbank
- Lines: 1mm 220.120 GHz
 3mm 109.700 GHz

3mm results

81; 3 SUM07-3 HNC0 3MM 30M-1M2-B100 O: 29-SEP-2007 R: 01-OCT-2007
RA: 17:47:14.146 DEC: -28:21:35.04 (2000.0) Offs: 0.0 0.0 Eq
Unknown Tau: 0.1234 Tsys: 270.2 Time: 43.99 El: 18.37
N: 512 I0: 336.1 V0: 72.00 Dv: -2.733 LSR
F0: 109782.200 Df: 1.000 Fi: 112612.882

3 mm (110 GHz)

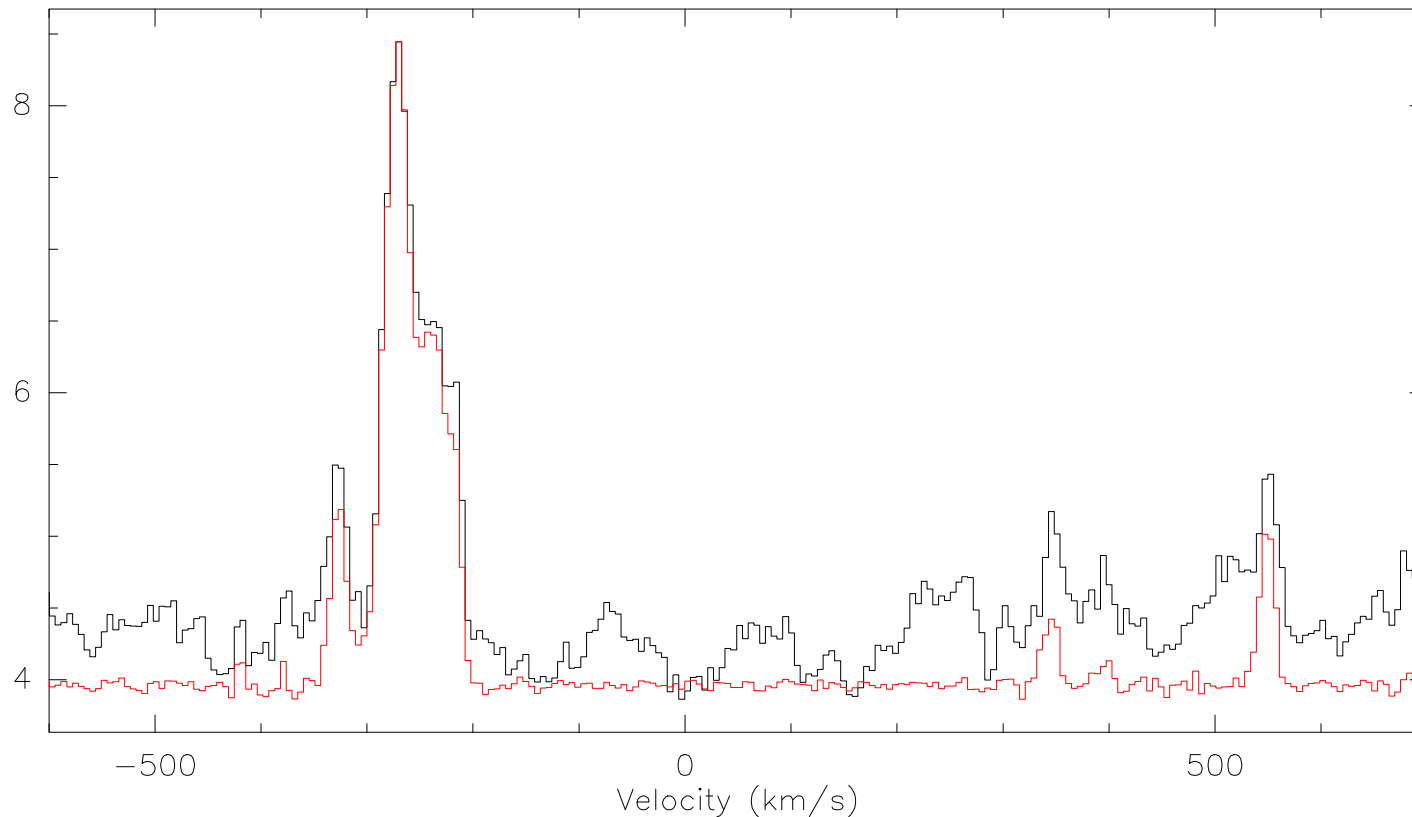


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Sinusoidal baseline subtraction

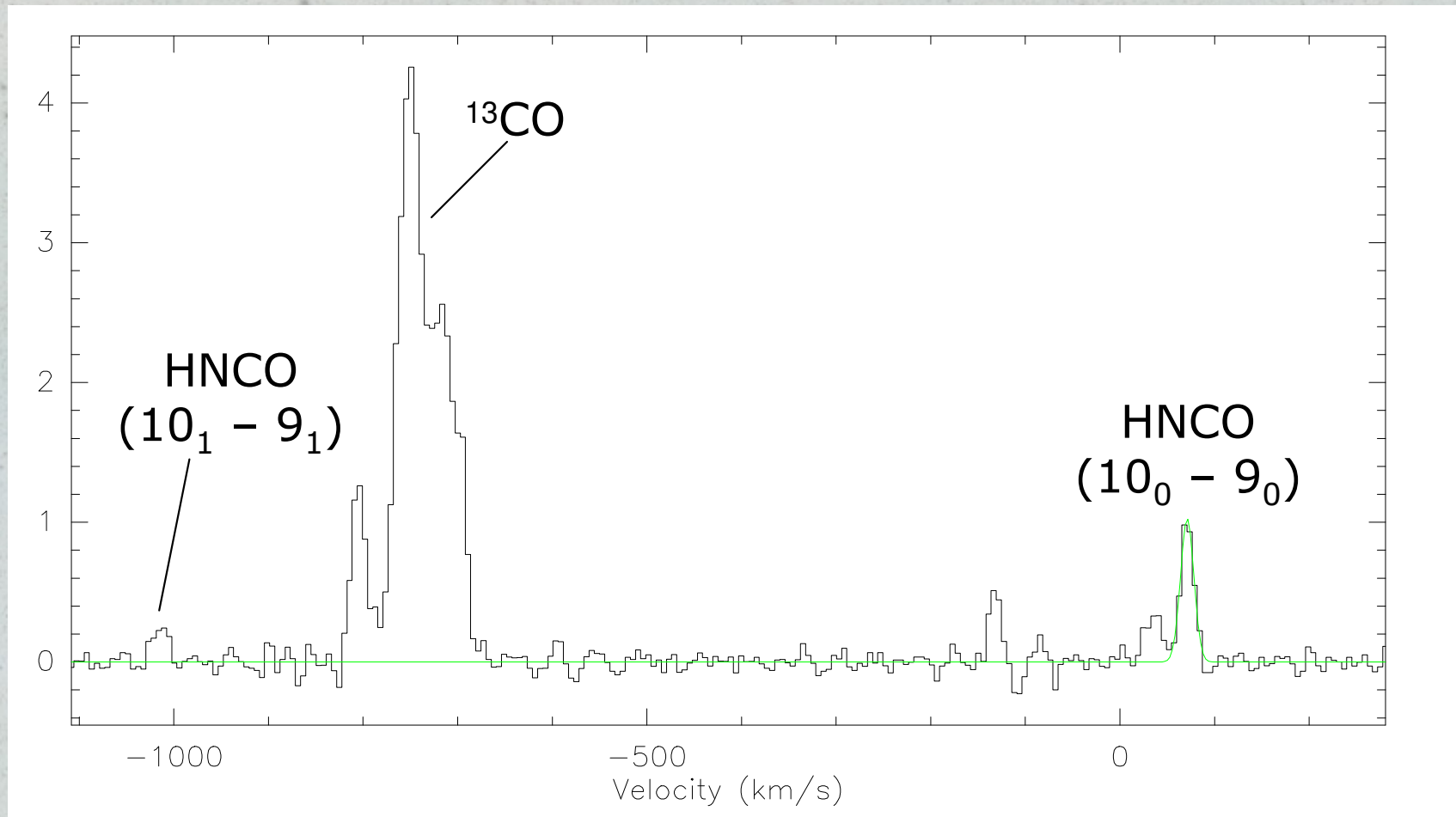
31; 2 SUM07-3 HNC0 1MM 30M-4M1-A230 O: 29-SEP-2007 R: 30-SEP-2007
RA: 17:47:14.146 DEC: -28:21:35.04 (2000.0) Offs: 0.0 0.0 Eq
Unknown Tau: 0.3627 Tsys: 1042. Time: 2.749 El: 19.18
N: 256 IO: 128.5 VO: 65.00 Dv: -5.447 LSR
FO: 220150.000 Df: 4.000 Fi: 228151.761

1 mm (220 GHz)

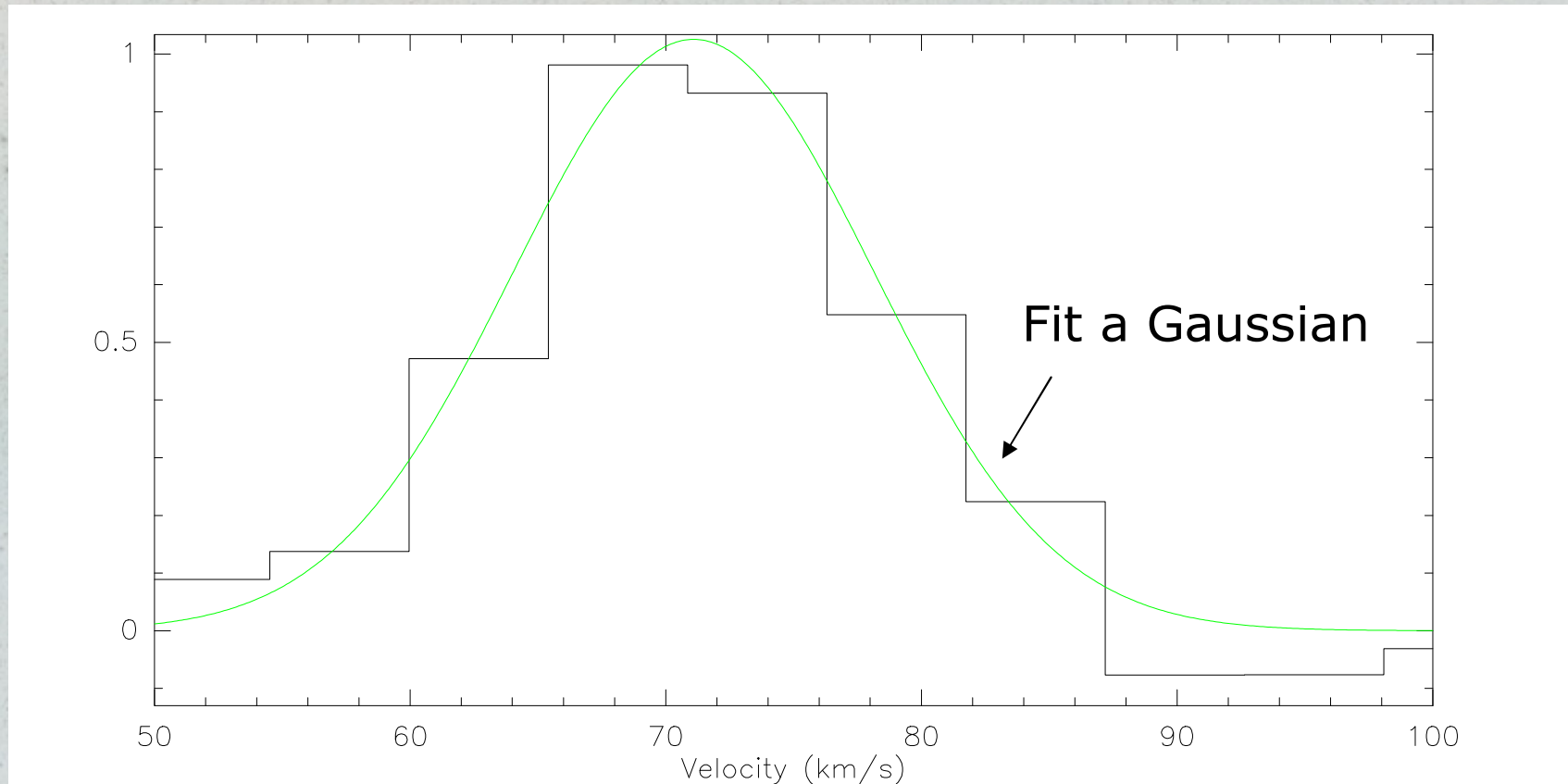


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Gaussian fitting

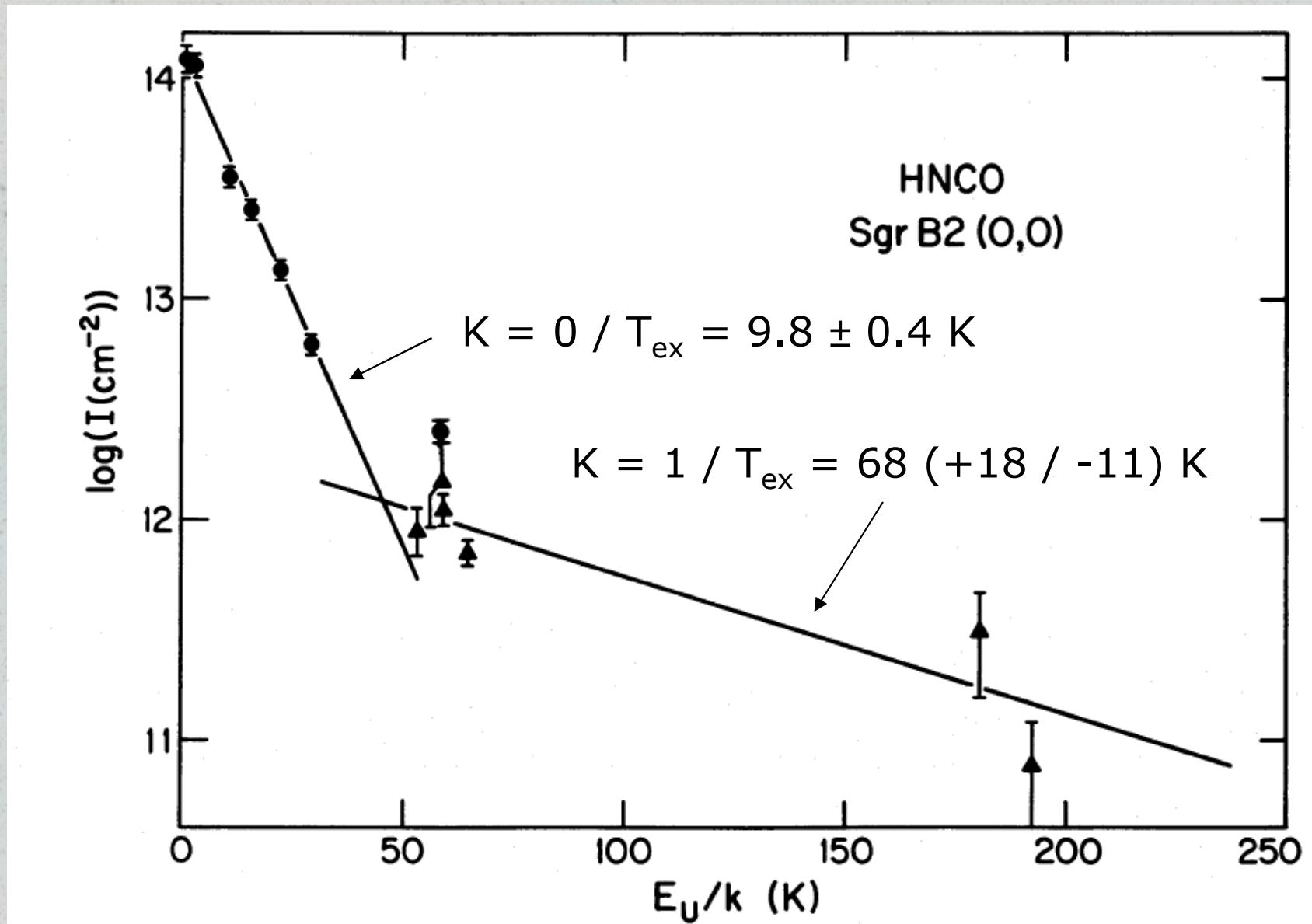


HNCO $10_0 - 9_0$ 219.798 GHz



→ Get the integrated line intensity

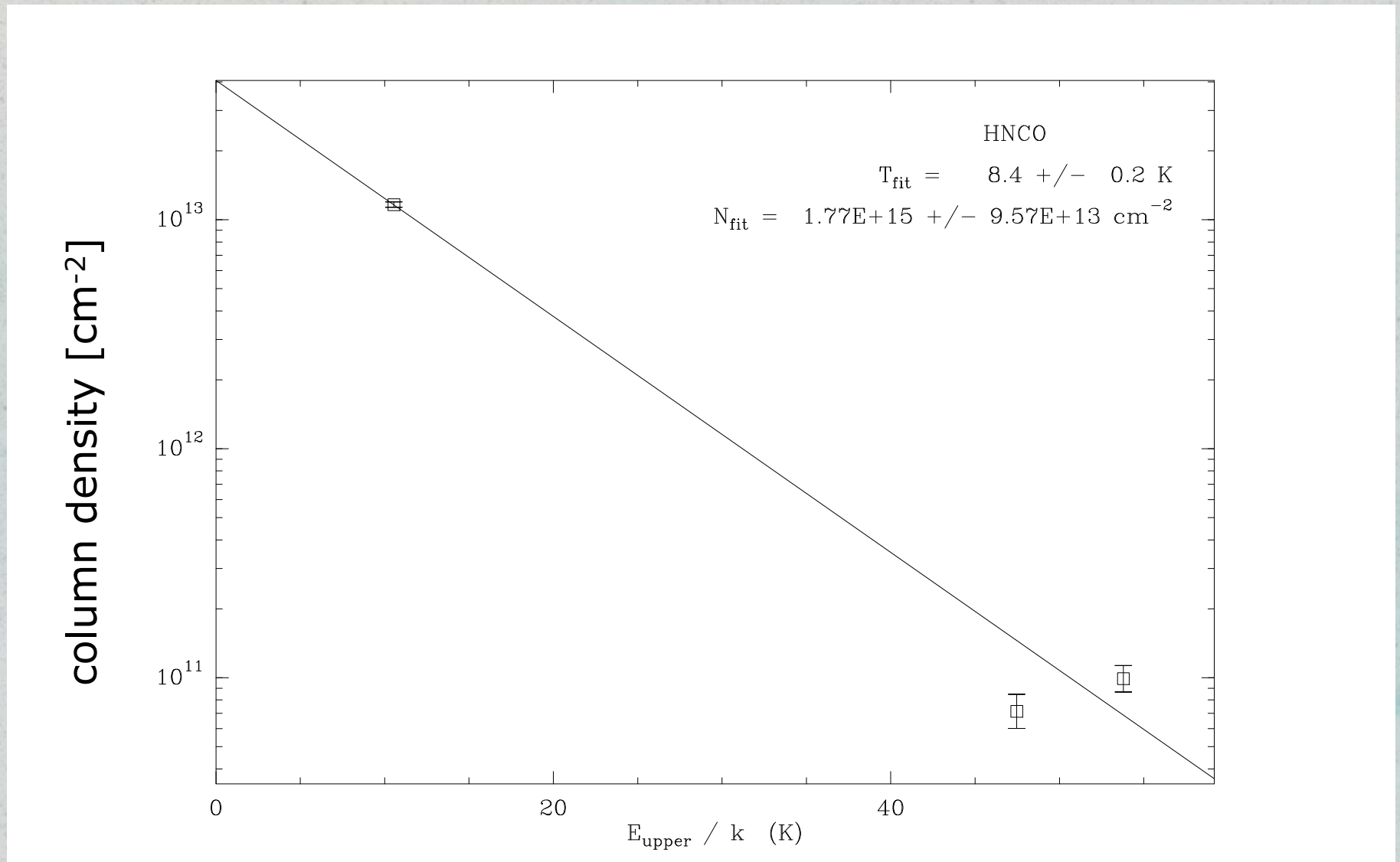
Rotational Diagram for HNC0



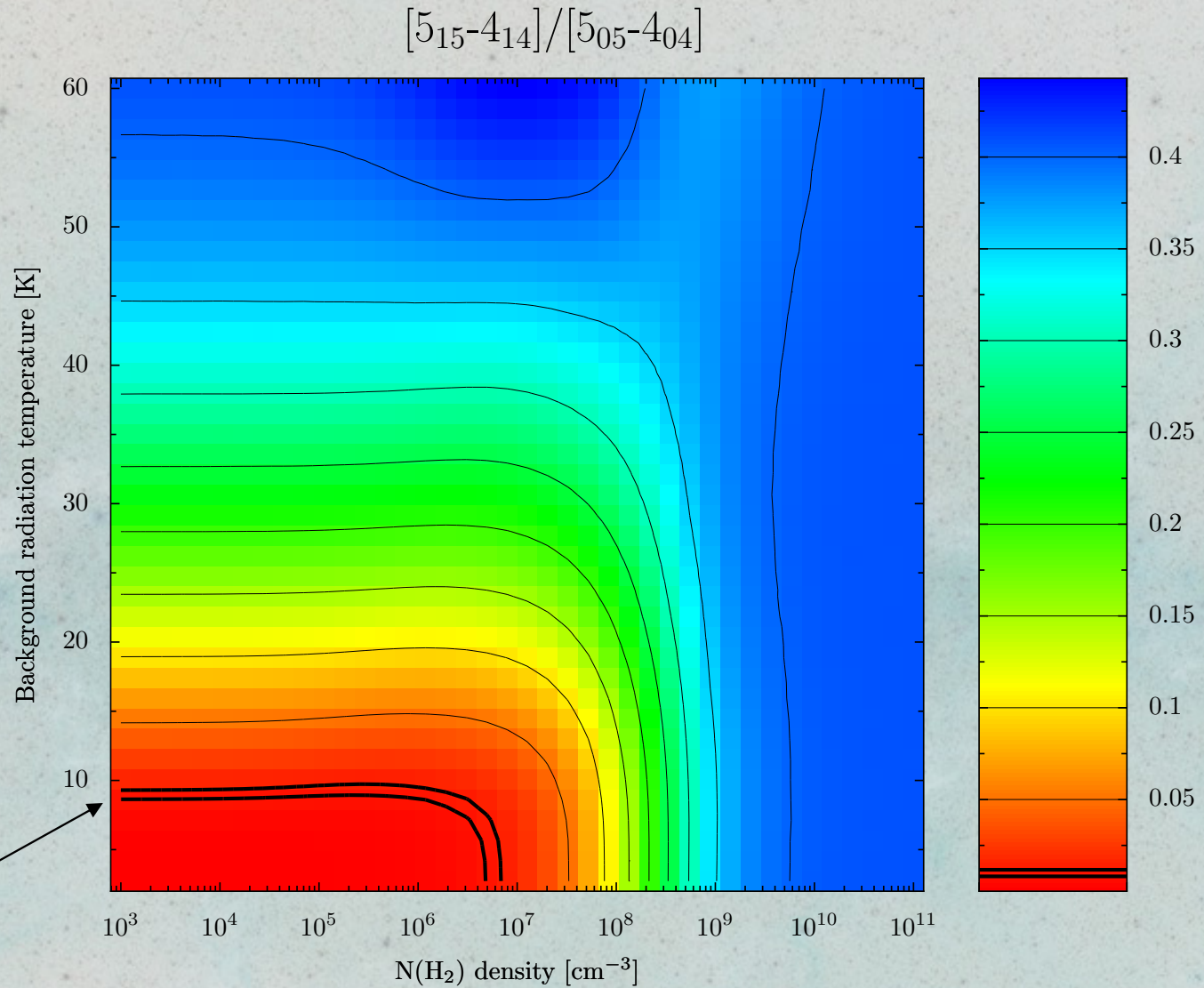
Churchwell et al. 1986 ApJ 305,405

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Rotational diagrams (Sum07-3)



Radiation Temperature



For all sources
except Sgr B2

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