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THE STAR FORMING REGION IN BOK GLOBULE 210-6a

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The NASA 64-m antenna at Tidbinbilla and the CSIRO 64-m antenna at Parkes have been used to observe the Bok Globule 210-6a ("Valentine's Night") in the (1,1), (2,2), and (3,3) transitions of ammonia. The beam sizes of the two telescopes were 55 arcsec and 81 arcsec, respectively. The observations are summarized below:

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Pos'n Tidbinbilla	R.A. (1950)	Decl.	Trans.	T_a	V_{lsr}	ΔV	τ
Center	$8^h24^m17^s$	-50°50'38"	(1,1)	0.08±0.07	5.1±0.1	1.6±0.2	1.3±0.8
			(2,2)	0.04±0.01	2.9±0.3	2.1±0.8	(0)
64" SW	8 24 12	-50 51 20	(1,1)	0.08±0.06	4.6±0.5	0.7±1.0	2.1±1.6
57" SE	8 24 21	-50 51 20	(1,1)	$<0.10(2\sigma)$			
HH47D	8 24 21	-50 49 33	(1,1)	$<0.06(2\sigma)$			
Parkes							
Center			(1,1)	0.34±0.15	4.9±0.1	1.0±0.1	1.0±0.7
			(2,2)	0.07±0.15	4.3±0.1	1.4±0.3	(0)
			(3,3)	$<0.02(2\sigma)$			

The kinetic temperature of the circumstellar condensation is 20 K, comparable to that derived from CO for the globule itself. The derived physical parameters are:

Assumed NH_3 Abundance	10^{-7}	10^{-8}	5×10^{-7}
H_2 column density (10^{21} cm^{-3})	$4.3^{+4.9}_{-2.7}$	$61.3^{+48.9}_{-46.9}$	1.0 ± 0.3
Source Size (1000 AU)	$8.8^{+10.1}_{-3.5}$	$7.4^{+4.6}_{-2.2}$	$12.7^{+10.0}_{-4.9}$
Density (10^4 cm^{-3})	$3.2^{+6.0}_{-2.9}$	56^{+64}_{-51}	$0.5^{+0.4}_{-0.3}$
Mass (0.01 $M_\odot$)	$12.5^{+7.5}_{-12.1}$	124^{+69}_{-66}	$5.8^{+8.9}_{-3.7}$

Since this condensation seen in ammonia is the only candidate for a circumstellar disk, it is curious that such a relatively modest structure should be associated with the highly collimated flow outlined by HH47.

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