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[1] Bracewell, R. N., Colvin, R. S., Price, K. M., and Thompson, A. R., *Sky and Telescope*, **42**, 4 (1971).
[2] Medd, W. J., Andrew, B. H., Harvey, G. A., and Locke, J. L., *Mon. Not. Roy. Astron. Soc.* (in the press).

Limits to the 2,695 MHz Circular Polarization of the September Cyg X-3 Flare

THE decay of the first September Cyg X-3 radio outburst was observed at 2,695 MHz (λ 11 cm) with the resurfaced 300-foot meridian transit telescope of the National Radio Astronomy Observatory (operated by Associated Universities Inc. under contract with the National Science Foundation). An on-axis feed system provided both left and right-handed circular polarizations. An instrumental polarization of $1.2 \pm 0.5\%$ (left-handed) was determined by observing fourteen extra-galactic sources at declinations between $+39°$ and $+42°$ and assuming these to have zero average circular polarization. Table 1 lists the total flux density and circular polarization

Table 1 Flux Densities and Circular Polarization of the Cyg X-3 Flare at 2,695 MHz

UT of observation	Flux density (10^{-26} W m^{-2} Hz^{-1})	$\frac{V}{I}$
02 h 55.3 min, September 5	13.3 ± 0.3	-0.014 ± 0.014
02 h 51.4 min, September 6	7.7 ± 0.2	-0.018 ± 0.014
02 h 47.4 min, September 7	3.65 ± 0.1	-0.016 ± 0.017
02 h 43.5 min, September 8	1.75 ± 0.08	-0.007 ± 0.030
02 h 39.6 min, September 9	0.92 ± 0.09	-0.010 ± 0.064
02 h 35.6 min, September 10	0.60 ± 0.10	—
02 h 31.7 min, September 11	0.32 ± 0.06	—
02 h 27.8 min, September 12	0.27 ± 0.05	—

measurements; column 3 gives values of the ratio of the Stokes parameters

$$\frac{V}{I} = \frac{\varepsilon_L^2 - \varepsilon_R^2}{\varepsilon_L^2 + \varepsilon_R^2}$$

together with their standard errors. Limits to the circular polarization of $0 \lesssim \frac{V}{I} \lesssim 3\%$ (right-handed) may be inferred.

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The Large Outburst in Cygnus X-3 at 8 GHz

HERE we present results of observations at 8 GHz during the decay phase of the recent outburst of Cygnus X-3 (refs. 1 and 2). We also compare our results with the flux density variation observed with the Haystack 120-foot telescope at 15.5 GHz (ref. 3) and describe a possible model for the source.

The measurements at 8 GHz were made using the University of Michigan 85-foot paraboloid which has a half-power circular beam width of 6 arc min. The radiometer was switched between the main antenna beam and a reference beam aimed 15.7 arc min east of the main beam in order to reduce the effects of tropospheric emission, but the source was only observed in the main beam in these measurements (see ref. 4 for details of observing procedure). Observations of Cygnus X-3 were alternated with observations of Cygnus A so that the relative gain of the antenna was generally known to within ~1%.

There are no strong thermal sources at the position of Cygnus X-3 (refs. 5 and 6). But the observations were partially confused by sources appearing in the main and reference beams at the "off-source" positions 20 arc min north and south of Cygnus X-3. To correct for this confusion effect, observations were made on September 15, 1972, using a single beam. Sets of off–on–off measurements were made using reference positions situated ±3, ±6, and ±10 arc min in declination and ±6 and ±10 arc min in right ascension, and these were compared with measurements made during the same observing period using the dual beam configuration with reference positions 20 arc min north and south of Cygnus X-3. We have applied the resulting additive correction term of -0.73 ± 0.10 f.u. to all of the dual-horn 20 arc min N-S observations.

Table 1 Observed Flux Density of Cygnus X-3 at 8 GHz

Universal time	S_ν (10^{-26} W m^{-2} Hz^{-1})	σ_s	Universal time	S_ν (10^{-26} W m^{-2} Hz^{-1})	σ_s
September 3, 1972			September 6, 1972		
h			h		
6.1	21.21	0.29	0.2	2.15	0.12
7.1	19.88	0.31	2.9	1.89	0.12
8.2	19.15	0.26	4.0	1.78	0.12
			4.9	1.94	0.12
September 4, 1972			6.0	1.91	0.16
h			8.3	1.59	0.22
0.8	11.53	0.15			
2.1	11.41	0.14	September 7, 1972		
3.5	11.07	0.15	h		
5.1	10.66	0.14	1.7	0.83	0.12
6.4	10.12	0.14	2.7	0.85	0.11
7.9	9.66	0.14			
			September 11, 1972		
September 5, 1972			h		
h			1.6	0.13	0.11
1.7	5.05	0.14			
3.1	4.79	0.16	September 15, 1972		
4.5	4.61	0.12	h		
5.9	4.53	0.13	2.1	0.12	0.06
7.6	4.14	0.38	3.4	0.03	0.07

The observational results are summarized in Table 1. The entries represent the results of 40 min observing periods centred on the quoted times except on September 3 when 15 min observing periods were averaged. The flux density values have been corrected for the confusion at the reference positions, and the standard errors include uncertainties in antenna gain, in telescope pointing and in the confusion correction term plus the measurement uncertainties due to random noise.