There are no significant differences in the "excess" coincidences between the runs with no differential delays and those with delays inserted. From runs 1, 3 and 5 we find the average excess counting rate, which might be attributed to genuine coincidences, to be $(-170 \pm 85) \times 10^{-4}$ detected photons s^{-1}, or $(-57 \pm 28) \times 10^{-5}$ detected photons (pulsar period)$^{-1}$. If we demand a significance criterion of 5σ, then we could have detected an effect if the excess coincidence rate had been 140×10^{-5} detected photons period^{-1}. The system was then calibrated on the star KW275 in the Praesepe group[9] immediately after these runs, its elevation in the sky being approximately the same as that for *NP* 0532. KW275 yielded a rate from the two phototubes taken together, corrected for sky background, of $1 \cdot 53 \times 10^4$ detected photons s^{-1}, or 511 detected photons per period of *NP* 0532. With an estimated quantum efficiency $\varepsilon = 0 \cdot 1$ (50 A/Lumen, data from EMI) and allowing for the factor ε^{-1} for the KW275 measurement, and a factor ε^{-2} for the coincidences, we deduce that we could have detected an effect if there existed a component of light from *NP* 0532 bunched with fine structure in the 20 ns region, which had an intensity exceeding $2 \cdot 7 \times 10^{-5}$ of the brightness of KW275. We make the assumption that the spectra of *NP* 0532 and KW275 are not too dissimilar, and that the S-4 cathode response is a reasonable match to both. With $m_B = 10 \cdot 54$ for KW275 (ref. 10), we conclude that if any light from *NP* 0532 is bunched in a single pulse of ~ 20 ns duration in each cycle, then its time-averaged magnitude must be $m_B \geq 22$. If, however, there are n such pulses in each cycle, the limit of detection is brighter by a factor $n^{1/2}$.

It thus seems unlikely that *NP* 0532 emits light which could be detected by existing Čerenkov light receivers.

Finally, we calculated the time dispersion, over the passband, caused by the interstellar plasma and found this to be negligible, $\sim 10^{-12}$ s. We have also considered the possibility of dispersion in the neutral atomic hydrogen in the galaxy. If we take $N_H \sim 1 \cdot 0$ atoms cm^{-3}, we find that the time-dispersion is again small, also $\sim 10^{-12}$ s, if we make the assumption that the refractive index of atomic hydrogen is similar to that of molecular hydrogen.

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Intensity Variations of *PSR* 0833–45 at 1,720 MHz

IN a recent article, Radhakrishnan *et al.*[1] commented on the remarkably constant intensity of pulsar *PSR* 0833–45 at 1,720 and 2,700 MHz. At these frequencies intensity values, averaged over 100 pulses and taken at any time over several days of observation in December 1968, showed less than 10 per cent variation. Large *et al.*[2] have noticed similar behaviour at 408 MHz. This property of the signal, in fact, greatly facilitated the taking of the polarization measurements which were the main subject of the article by Radhakrishnan *et al.*

Observations made at 1,720 MHz on July 20, 1969, indicate that the intensity of *PSR* 0833–45 had become extremely variable. The measurements were made at the Parkes Observatory using the 210-foot telescope. A linearly polarized aerial feed was used in conjunction with the same 1,720 MHz receiver that was used in the observations referred to earlier. The i.f. band-pass was restricted to 100 kHz in order to avoid smearing of the recorded pulse due to dispersion and the pulsar signal was recorded using a 400-channel integrator driven at the expected pulsar repetition rate by timing signals derived from a precise frequency standard. The position angle of the feed was set at 135° throughout the present measurements. Integrated pulse shapes were obtained for a series of sets of 400 pulses over a total observing time of about 40 min.

The results of the measurements showed that intensity variations of approximately 5 : 1 occurred during the observation. This degree of variation is considerably greater than reported at 4,800 MHz by Gardner and Whiteoak[3], who observed mean variations of about 50 per cent of the mean intensity, and at 408 MHz by Wielebinski[4]. Comparison between the present results and the earlier 1,720 MHz observations indicates that the degree of intensity variation of *PSR* 0833–45 changes markedly with time.

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Flux Density Variation in VRO 42 22 01 at 1,420 MHz

SEVERAL recent papers[1–3] have drawn attention to the interesting properties of the radio source VRO 42 22 01 and its optical counterpart BL Lac. In particular, Andrew *et al.*[4] have reported the results of monitoring the intensity of this source at 6,630 and 10,630 MHz since December 1967, and point out particularly rapid changes in intensity at both frequencies. Seilstad and Yip[5] found variations at 8,300 and 9,600 MHz, and also reported a flux density at 1,420 MHz measured in November 1968 of $4 \cdot 2$ flux units (1 flux unit $= 10^{-26}$ W m^{-2} Hz^{-1}), a value considerably below the $6 \cdot 9$ and $7 \cdot 3$ flux units reported for 1964 (ref. 6) and 1965 (ref. 7) respectively.

Recent continuum flux density measurements confirm this change in intensity at 1,420 MHz and show that in late December 1968 the source intensity had dropped to below 50 per cent of the average of the 1964 and 1965 measurements, and has now returned to about 80 per cent of this value in a period of about three months.

All the published flux densities at 1,420 MHz for VRO 42 22 01 are shown in Fig. 1 together with new measurements made on December 24, 1968, February 6, 1969, and July 5 and 10, 1969, with the 25·6 m radio telescope of the Dominion Radio Astrophysical Observatory. The flux densities, in units of 10^{-26} W m^{-2} Hz^{-1}, obtained on these dates are $3 \cdot 3 \pm 0 \cdot 5$, $4 \cdot 9 \pm 0 \cdot 5$, $5 \cdot 8 \pm 0 \cdot 6$ and $5 \cdot 9 \pm 0 \cdot 4$. Also shown is the average of four measurements made on April 22, 25, 26 and 27 with the 91 m telescope at NRAO Green Bank which gave a value of $(5 \cdot 9 \pm 0 \cdot 2)$ 10^{-26} W m^{-2}