Pulse intensity histograms for nine pulsars

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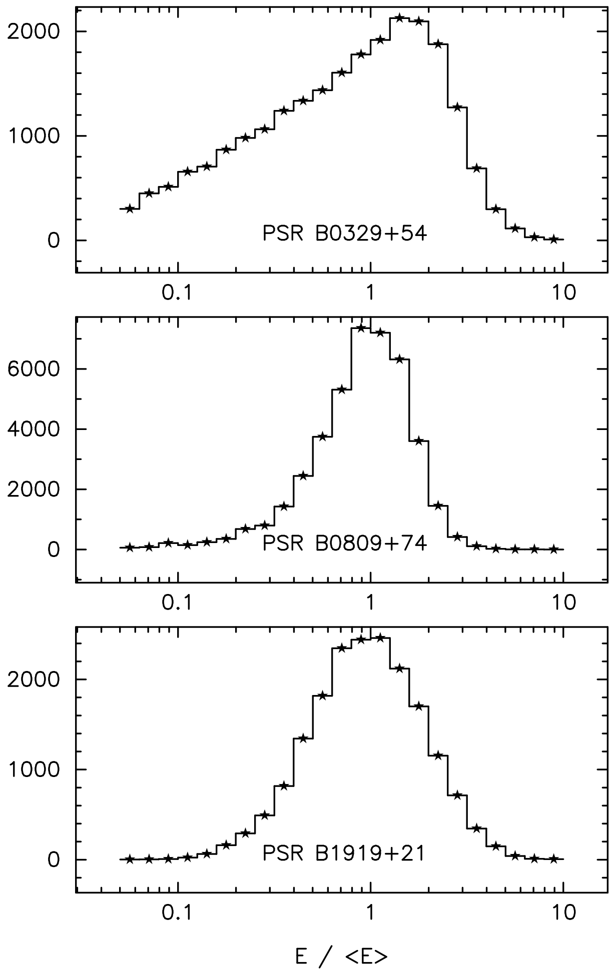

Figure 1: The pulse energy histograms of three pulsars (in units of mean).

The recent literature on the energy distribution of single pulses is rather sparse (except for pulsars showing giant pulses). Johnston et al. [1] showed that the logarithm of the flux density of single pulses from the Vela pulsar had a Gaussian distribution (the so-called log-normal distribution). In retrospect, the distributions of single pulse energies were shown in [2] and [3] for a variety of pulsars. In this report I show the distributions of single pulse energies for nine strong pulsars at the frequency of 111 MHz.

The observations were made during 2004 with the Large Phase Array (BSA) Radio Telescope at Pushchino Radio Astronomy Observatory. BSA is a transit telescope. The duration of each observation session was about $3.2/\cos\delta$ minutes. I used a 128-channel receiver with channel bandwidth 20 kHz, and the time constant was $\tau = 1$ ms.

Figure 1 shows the histograms of energy distributions for the three pulsars: PSR B0329+54 (58 days, 320 min, 26 970 periods), PSR B0809+74 (78 days, 930 min, 43 290 periods), and PSR B1919+21 (155 days, 530 min, 24 025 periods). The abscissae are in units of the mean pulse energy, $\langle \mathrm{E} \rangle$, and the ordinates show the number of pulses contained in every energy resolution bin. The distribution for PSR B1919+21 is clearly log-normal, but one for PSR B0329+54 is not.

References

[1] S. Johnston et. al. ApJ, 549, L101 (2001)

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