

# Vela Glitch Monitoring from HartRAO

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**Abstract.** The Vela pulsar, like many other young pulsars, undergoes occasional sudden “spin-ups” in rotational frequency known as glitches. These glitches are characterised by a sudden (less than 30s) rise in the rotation frequency accompanied by a jump in the spin-down. This is generally followed by rapidly decaying transients in the spin-down and a gradual linear recovery. This recovery provides insight into the internal structure of the neutron star.

The telescopes at HartRAO was been used to monitor the Vela pulsar almost daily from 1985 in order to monitor these glitches. The vast majority of these observations were made using the 26m antenna at 1.6 GHz and 2.3 Ghz. When the 26m antenna was offline due to a bearing failure for two years from 2008 the 15m MeerKAT prototype antenna was used to observe Vela.

During the entire monitoring campaign 10 large glitches have been observed. The majority of the glitches show a similar recovery pattern. We discuss the characteristics of this common recovery. We compare the standard glitch recovery to that predicted by a hydrodynamic model of the neutron star interior.

An exception to the standard glitch are the two glitches which occurred in 1994 separated by 32 days. This “double” glitch is unique amongst Vela glitches. The event is accompanied by typical transients in rotation frequency derivative but all of the long-term offset occurs at the first event and the rapidly-decaying transient is only seen with the second spin-up.