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A low frequency study of PSRs B1133+16, B1112+50, and B0031-07

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The low frequency (110--180 MHz) capabilities of the Westerbork Synthesis Radio Telescope (WSRT) are used to characterise a large collection of single pulses from three low magnetic field pulsars. Using the Pulsar Machine II (PuMa-II) to acquire and coherently dedisperse the pulsar signals, we examine whether the bright pulses observed in these pulsars are related to the classical giant pulse emission. Giant pulses are reported from PSR B1112$+$50 and bright pulses from the PSRs B1133$+$16 and B0031$-$07. These pulsars also exhibit large intensity modulations observed as rapid changes in the single pulse intensity. Evidence of global magnetospheric effects is provided by our detection of bright double pulses in PSRs B0031$-$07 and B1133$+$16. Using the multi-frequency observations, we accurately determine the dispersion measures (4.844$\pm$0.002 for B1133$+$16 and 9.1750$\pm$0.0001 for B1112$+$50), derive the radio emission height in PSR B1133$+$16 and report on the properties of subpulse drift modes in these pulsars. We also find that these pulsars show a much larger intensity modulation at low sky frequencies resulting in narrow and bright emissions.

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