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Gamma-ray pulsar glitches: a study of variability in Fermi-LAT data

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Pulsars are the largest class of Galactic sources detected by NASA's Large Area Telescope (LAT) on the Fermi mission. Pulsars are generally acknowledged as very stable astrophysical rotators, and they gradually slow down by emitting radiation at the expense of their rotational energy. Occasionally, pulsars can undergo transient events called glitches, which consist in rapid changes in their rotational parameters and are often followed by a relaxation. Variability in the emission features correlated to glitches has been observed in a small family of radio pulsars and in the radio-quiet PSR J2021+4026, which is the only variable pulsar observed by the LAT. Here we present a novel analysis of LAT gamma-ray pulsars consisting of a study of variability correlated with changes in the spin-down rate. We perform a maximum likelihood spectral analysis of LAT data around detected glitches, aiming at measuring variations in the gamma-ray flux and spectral parameters. We present results for a subset of glitches that we consider particularly promising. Our study suggests the importance of variability analysis to achieve a deeper understanding of pulsar physics.

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