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A new mode change in the variable gamma-ray pulsar PSR J2021+4026

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The radio-quiet gamma-ray pulsar PSR J2021+4026, in the Gamma Cygni supernova remnant, is one of the brightest *Fermi*-LAT pulsars. It first drew attentions in October 2011, when it underwent an abrupt drop in its gamma-ray flux, with a simultaneous increase in its spin-down rate. This mode change was followed by a smooth recovery phase around December 2014, then by a similar mode change in February 2018. Being the only variable isolated gamma-ray pulsar observed so far, PSR J2021+4026 has been studied during the whole duration of the *Fermi*-LAT mission and is currently being monitored. We report an updated LAT analysis focusing on the most recent variability event, which occurred in May 2020. In order to characterize the variability of the pulsar, we studied the variations in spectrum, timing and pulse profile in details. We discuss the results using the most recent pulsar models and linking the observed variations to changes in the configuration of the magnetosphere. Monitoring activities on this unique pulsar will help us understand the poorly known mechanisms of variability in gamma-ray emitting neutron stars.

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