

Search for Very High Energy Emission from the millisecond pulsar PSR J0218+4232

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PSR J0218+4232 is a millisecond pulsar (MSP) with high magnetic field strength at the light-cylinder radius ($B_{LC} \sim 3.2 \times 10^5$ G), making it one of the best candidates for VHE gamma-ray emission. It was one of the first MSPs detected by Fermi-LAT at high energy. The source is possibly an aligned rotator with large unpulsed component (~50%) in radio and X-rays.

For this study, we have analyzed 11.5 years of Fermi-LAT data and 90 hours of MAGIC observations (MJD 58424 - 58791). Fermi-LAT analysis shows evidence for pulsed emission above 25 GeV. MAGIC observations were performed with a sub-100 GeV optimized Sum-Trigger II system. Due to the unpulsed component, we searched for pulsed emission by using a new background subtraction approach. We did not find any evidence for pulsed or unpulsed VHE emission. Lack of VHE emission detection with our instruments is compatible with our theoretical modeling.

Keywords

pulsars; gamma-rays; PSR J0218+4232

Collaboration

MAGIC

other Collaboration

Fermi-LAT

Subcategory

Experimental Results

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