AGILE detection of transient gamma-ray emission from the region of the supergiant fast X-ray transient IGR J17354-3255

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Abstract

On April 14, 2009, the AGILE satellite detected a gamma-ray flare from an unknown transient source. Subsequent X-ray follow-up observations with Swift and INTEGRAL identified the supergiant fast X-ray transient (SFXT) IGR J17354-3255 as the most likely counterpart, based on positional coincidence and similar temporal behaviour. Aside from this indication, no SFXT has been firmly detected at high energies to date. SFXTs are a subclass of high-mass X-ray binaries (HMXBs) hosting a massive OB supergiant donor star and displaying the most extreme X-ray variability among HMXBs. These systems might be able to emit MeV-TeV photons through fast flares lasting from hours to a few days, with a low duty cycle. In this work, we analyse archival AGILE data to search for gamma-ray flares associated with IGR J17354-3255 and investigate their possible physical origin. We identified a transient source, AGL J1736-3250, which emitted 19 gamma-ray flares and is positionally consistent with IGR J17354-3255. Most flares, detected on a 24 hour timescale, concentrate their emission within two-, four-, and six-hour intervals, resembling the X-ray flaring behaviour of IGR J17354-3255. An orbital phase analysis revealed that approximately half of the gamma-ray activity occurs near the apastron passage of the compact object hosted in the binary system. We also incorporated archival Swift and INTEGRAL observations to derive phase-folded light curves at lower energies. These results support a physical association between IGR J17354-3255 and AGL J1736-3250, providing evidence that SFXTs could constitute a new class of Galactic high-energy transient emitters.

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