

Optical studies of gamma-ray binaries and candidate systems

Highly accurate photometry of the optical companion in gamma-ray binary systems has the potential to enable the exploration of previously unknown phenomena. Here we report the discovery of repeated optical flares evolving on time scales of about one day in the optical light curve of the well known system LSI +61303. Their amplitude does not exceed 0.01-0.02 magnitudes and, therefore, they are only within reach of space observatories such as the Transiting Exoplanet Survey Satellite (TESS) in the 600-1000 nm band-pass. We tentatively propose that these flaring events are shock-powered in nature as the compact object in LSI+61303 interacts with the circumstellar envelope of its Be star companion. Comparison with other systems (MWC 148 and MWC 656) is also addressed. Moreover, the TESS data appears as a useful complementary tool to search for signatures of binarity in other stellar objects tentatively associated with unidentified gamma-ray sources.

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