

Search for new gamma-ray binaries using Gaia

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Gamma-ray binaries are extreme accelerators that display gamma-ray emission up to multi-TeV energies. These systems are composed of a massive OB-type star and a compact object that show a non-thermal spectral energy distribution that peaks in the MeV-GeV band and is modulated with the orbital period. Currently, only 9 of such extreme accelerators are known. However, some properties of these systems are not fully understood, and the discovery of new gamma-ray binaries will help to answer many questions. On the other hand, binary systems containing a massive star and a compact object can present a peculiar velocity with respect to their environment due to the kick produced by the supernova explosion in the formation of the compact object. If the velocity is high enough these binary systems are called runaways. All gamma-ray binaries containing O-type stars are runaways, which can be identified as such by means of optical astrometry. Therefore, to discover new gamma-ray binary systems first we search for runaway massive stars within the GOSC Catalog of O-type stars using Gaia astrometric data. We present here the current status of the project and initial promising results, together with an outlook of the next steps to be conducted before assessing the gamma-ray binary nature of these systems. These sources will be studied in the future with CTA.

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