CTA: an optimal instrument for microquasar hunt

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Abstract

The Cherenkov Telescope Array is the next generation ground-based gamma-ray observatory designed to detect photons in the 20 GeV to 300 TeV energy range with an 8 degree field of view. This low energy threshold coupled and a significant improvement in sensitivity on minute-to-hour timescales with respect to the currently running gamma-ray facilities makes CTA an optimal instrument for transient detections. With a field of view _˜8 times smaller than the Fermi-LAT one, CTA is a potential transient factory given its unprecedented sensitivity on sub-minutes scales, several orders of magnitude better than Fermi-LAT. CTA will therefore provide the astrophysical community with triggering alerts of flaring sources thanks to the development of an optimized real time analysis. In this contribution we will report the most updated CTA sensitivity studies for transient detections, with a special focus on the CTA perspectives to advance our understanding of X-ray binaries. The gamma-ray emission from microquasars provides, in fact, valuable information on the acceleration processes inside the jets, the jet-environment interaction and

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the disk-jet coupling. So far only a handful of microquasars has been detected above 100 MeV by Agile and Fermi-LAT, but at energies above a few tens of GeV there are only hint of signals. The goal of this contribution is to investigate which of the still-open questions can be addressed by CTA.

Keywords: CTA, X, ray binaries, gamma rays, high energies