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On TeV Gamma-rays from Galactic X-ray Binary Systems with H.E.S.S. array

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With the birth of the new generation ground-based gamma-ray imaging atmospheric Cherenkov telescope arrays (such as H.E.S.S., MAGIC and VERITAS), there is a growing need to probe X-ray binary stars for very high energy gamma-ray emissions. Since the discovery of the first extra-solar X-ray binary (XRB), namely the Scorpius X-1 in 1962, XRBs are now well-established systems in the realm of X-ray astronomy. Today Scorpius X-1, with X-ray output energy 100 000 times greater than the total radiation of the Sun at all wavelengths, is today known as a microquasar. In order to foster the multi-wavelength campaigns of the day, we selected candidate XRBs from the Galaxy that were observed by H.E.S.S. for purposes of searching for significant TeV gamma-ray emission from these. Paredes (2008) confirmed four XRBs to be candidates that can be listed on the gamma-ray sky map. These were PSR B1259-63, LS I +61 303, LS 5039 and Cygnus X-1. From a survey of 125 known XRBs, Dickinson (2009) reported no conclusive detections of TeV emissions. The present study presents the Cherenkov technique, a briefing on X-ray binaries, known radiation mechanisms, relevant analysis techniques, and report on the preliminary results of Galactic XRBs that do not add any of the candidate XRBs to the envisaged catalogue of TeV gamma-ray binaries. It is an astrophysical hope that the envisaged CTA (Cherenkov Telescope Array), which may be hosted by South Africa, will provide the anticipated discoveries, providing a deep insight of the TeV gamma-ray sky.

Level (Hons, MSc, PhD, other)?

PhD

Consider for a student award (Yes / No)?

Yes

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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