

Abstract Submitted
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Searching for High-Mass Microquasars with HAWC¹ CHANG DONG RHO, Univ of Seoul, KE FANG, Stanford University, HAWC COLLABORATION — High-mass microquasars (HMMQs) are powerful particle accelerators, but the mechanism of their high-energy emission is poorly understood. A few of these particle engines have been observed to emit gamma-ray photons and are potential very-high-energy (VHE) gamma-ray emitters. In this work, we study four HMMQs (LS 5039, Cyg X-1, Cyg X-3, and SS 433) using 1,523 days of data from the High Altitude Water Cherenkov (HAWC) observatory. We report the most stringent limit to date on the gamma-ray emission by each source above 10 TeV. By stacking the likelihoods of all HMMQs that are accessible to HAWC, we constrain the fraction of the jet luminosity in emitting VHE gamma rays and high-energy neutrinos. We also show that the non-detection of VHE gamma-rays implies a significant magnetic field, which challenges synchrotron radiation as the dominant mechanism of the microquasar emission between 10 keV and 10 MeV.

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