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Fermi-LAT daily monitoring observations of the microquasar Cygnus X-1 STEPHEN HOOD, AUSTIN WALDRON, ARASH BODAGHEE, Georgia College and State University — A microquasar is an accreting compact object (such as a neutron star or a black hole) with relativistic jets. These are much smaller versions of quasars which are supermassive black holes occupying the centers of large galaxies. Their smaller size enables them to vary on short timescales of hours to days, compared with months to years for quasars. Therefore, microquasars are important tools for studying the physics of matter in extreme electromagnetic and gravitational fields. While they are expected to emit across the electromagnetic spectrum, only a handful of microquasars have ever been detected in gamma-rays and these detections are rare and short-lived. In this study, we analyzed over eight years of gamma-ray observations of a well-known microquasar called Cygnus X-1 as gathered by the Fermi space telescope. Our study continues the daily monitoring previously introduced in Bodaghee et al. (2013) with new data extending from 2012 to 2016. The purpose of the study is to confirm previous gamma-ray outbursts of Cygnus X-1, and to detect new candidate outbursts (a dozen of which were found). Detection of gamma-ray emission from microquasars is important for understanding particle acceleration in the jet, and for constraining leptonic/hadronic emission models.

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