

Why no VHE GRBs were detected before 2018?

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Imaging Atmospheric Cherenkov Telescopes (IACTs) have been searching for very high energy (VHE) emissions from gamma-ray bursts (GRBs) for nearly two decades. However, the first confirmed detections of VHE gamma rays from GRBs were only made in 2018-2019, with only three published cases: GRB 180720B, GRB 190114C, and GRB 190829A. These observations reveal similarities in the temporal evolution of X-rays and VHE gamma-rays. In this study, we analyze all GRB alerts from 2014 to the present day that were observable by IACTs. We use this established observational link to predict the VHE flux and assess the possibility of detecting VHE emission, taking into account EBL absorption effects, IACT sensitivity, and IACT follow-up strategies that have evolved over time. We identify potential missed opportunities and evaluate them on a case-by-case basis, seeking to answer the question of why no VHE emission from GRBs was detected before 2018.

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