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# Towards an AI-based trigger system for the next-generation of imaging atmospheric Cherenkov telescope cameras

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Imaging atmospheric Cherenkov telescopes (IACTs) observe extended air showers (EASs) initiated by the interaction of very-high-energy gamma rays and cosmic rays with the atmosphere. Cherenkov photons induced by a given shower are focused onto the camera plane of the telescopes resulting into a spatial and temporal charge development in the camera pixels. Besides the Cherenkov light emitted by the EAS arriving within a few nanoseconds (depending on their primary energy, zenith angle, and distance from the telescope), the IACT cameras continuously record light from the night sky background (NSB), which is mainly composed of atmospheric star, moonlight scattering, galactic diffuse emission and other manmade sources of light. To ensure optimal data-taking under diverse observational conditions (zenith angle, moon phase, quality of the atmosphere,...), the trigger and data acquisition system of IACT cameras is designed to reduce the noise induced by the fluctuations of the NSB as well as the electronic noise of the photodetectors from the short Cherenkov light flashes as much as possible by carrying out an on-the-fly event selection process. In this contribution, we present some prospective studies for an application of an Artificial Intelligence (AI)-based trigger system for the next-generation of IACT cameras using the software package CTLearn. As a high-level step of the novel trigger system, we show that gamma/hadron separation could be performed at trigger-level to distinguish gamma-like events from hadronic showers initiated by cosmic rays, which is the dominant background for IACTs.

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