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Development of a SiPM Camera for a Schwarzschild-Couder Cherenkov Telescope for the Cherenkov Telescope Array

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We present a development of a novel 11328 pixel silicon photomultiplier (SiPM) camera for use with a ground-based Cherenkov telescope with Schwarzschild-Couder optics as a possible mid-size telescope for the Cherenkov Telescope Array (CTA), which is the next generation very-high-energy gamma-ray observatory. . The finely pixelated camera samples air-shower images with more than twice the optical resolution of cameras that are used in current Cherenkov telescopes. Advantages of the higher resolution will be a better event reconstruction yielding improved background suppression and angular resolution of the reconstructed gamma-ray events, which is crucial in morphology studies of, for example, Galactic particle accelerators and the search for gamma-ray halos around extragalactic sources. Packing such a large number of pixels into an area of only half a square meter and having a fast readout directly attached to the back of the sensors is a challenging task. For the prototype camera development SiPMs from Hamamatsu with through silicon via (TSV) technology are used. We give a status report of the camera design and highlight a number of technological advancements that made this development possible.

Collaboration

CTA

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