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CHEC: A Compact High Energy Camera for CTA

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The Cherenkov Telescope Array will provide unprecedented sensitivity and angular resolution to gamma-rays across orders of magnitude in energy. Above 1 TeV up to around 300 TeV an array of Small-Sized Telescopes (SSTs) will cover several kilometres on the ground. The Compact High-Energy Camera (CHEC) is a proposed option for the camera of the SSTs. CHEC contains 2048 pixels of physical size about 6 mm × 6 mm, leading to a field of view of over 8 degrees. Electronics based on custom Target ASICs and FPGAs sample incoming signals at a gigasample per second and provide a flexible triggering scheme. Waveforms for every pixel in every event are read out without loss at over 600 events per second. A telescope prototype in Meudon, Paris saw first Cherenkov light from air showers in late 2015, using the first CHEC prototype. Research and development for CHEC is currently focussed on taking advantage of the latest generation of silicon photomultipliers (SiPMs). Here I present an introduction to CTA followed by details of the CHEC design and performance with focus on the latest developments in SiPMs and signal digitisation. Results from lab and field tests will be shown and the progress made to a robust camera design for deployment within CTA given.

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