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The FlashCam Camera for the Medium-Sized Telescopes of CTA

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The Cherenkov Telescope Array (CTA) is the next generation ground-based instrument for the detection of cosmic gamma-rays with energies from about 20 GeV up to several hundred TeV. It is envisaged to be comprised of large-, medium- and small-sized telescopes (23m, 10-12m and 4m mirror aperture, respectively). Within the scope of the FlashCam project, a novel camera for the medium-sized telescopes of CTA has been developed. Its integration follows a horizontal architecture, where the photon detector plane (hosting photosensors and preamplifiers) is a self-contained unit interfaced through analog signal transmission cables to crates containing the readout electronics. The FlashCam design features fully digital readout and trigger electronics based on commercial ADCs and FPGAs as key components. In this way different type of digitization schemes and trigger logics can be implemented, without exchanging any hardware. The data transfer from the camera to a server is Ethernet-based, and processing rates (including event building) up to about 2 GBytes/sec have been achieved. Together with the dead-time free signal digitization this allows to operate at trigger rates up to several tens of kHz. Extensive tests and measurements with a 144-pixel setup (equipped with photomultipliers and electronics) have been performed, the results of which will be reported. In addition, the status of the preparations for a 1764-pixel prototype with full-scale mechanics and cooling system will be presented.

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