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Camera Prototype Performances and Calibration for the Cherenkov Telescope Array

The Cherenkov Telescope Array (CTA) will comprise a sub-array of up to 70 small sized telescopes (SSTs) in the southern array. Different implementations are proposed for the SSTs but all of them feature Silicon Photomultipliers (SiPM), which can guarantee excellent performance and allow observation also under moonlight increasing the observational time and then physics reach. The SST-1M project, a 4 m-diameter Davies Cotton telescope with 9 degrees FoV and a 1296 pixels SiPM camera (hexagonal SiPM S10943-2832(X)), is designed to meet the requirements of the next generation of ground based gamma-ray observatory CTA in the energy range above 3 TeV.

The large scale production of the telescopes imposes a fully automated calibration strategy of SiPM cameras. A dedicated hardware, the Camera Test Setup (CTS), has been designed and built for such purpose. For each camera pixel, CTS is equipped with two LEDs, one operated in pulsed mode to emulate signal and one in continuous mode to emulate night sky background.

In this work, a special emphasis will be given to the commissioning results but also to the latest performance validation tests such as charge resolution, trigger efficiency together with Monte-Carlo comparison. These results will allow to validate the camera prototype in laboratory for the second observation campaign with the telescope prototype foreseen this Summer in Krakow.

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Track Classification: Large Scale Characterization and Reliability