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# FAMOUS - A Prototype Silicon-Photomultiplier-Telescope for the Fluorescence Detection of Ultra-High-Energy Cosmic Rays

Due to their high photon detection efficiency, silicon photomultipliers (SiPMs) promise to increase the sensitivity of today's fluorescence telescopes which use photomultiplier tubes to detect light originating from extensive air showers. On the other hand drawbacks like a small sensitive area, a strong temperature dependence, a high noise rate and a reduced dynamic range have to be managed.
We present plans for FAMOUS, a prototype fluorescence telescope using SiPMs and a special light collecting optical system of Winston cones to increase the sensitive area. The prototype will make use of a Fresnel lens with imaging properties which fulfill all functional requirements for the application within the detector. For several different types of SiPMs, we measured the photon detection efficiency and its dependence on the incident angle of light. Further measurements include noise effects of the SiPM as well as its temperature dependencies, and we offer methods how to overcome these challenges. Moreover, we will present the R&D in compact modular electronics using photon counting techniques. Since the main background to the fluorescence signal derives from the night-sky brightness, a single-pixel-SiPM-telescope measured the photon flux of the night-sky. This allows the evaluation of the performance of the optical telescope design by means of a full detector simulation.

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