

Figure 11: **Left** : Photon density of the Cherenkov ring as seen from the telescope produced by 100 PeV protons for different heights as a function of distance from the shower axis. **Right**: Photon spectral composition for showers produced at different altitudes in the atmosphere. The deeper the shower the more the photons will be scattered in the atmosphere and spectral emission moves toward the red band.

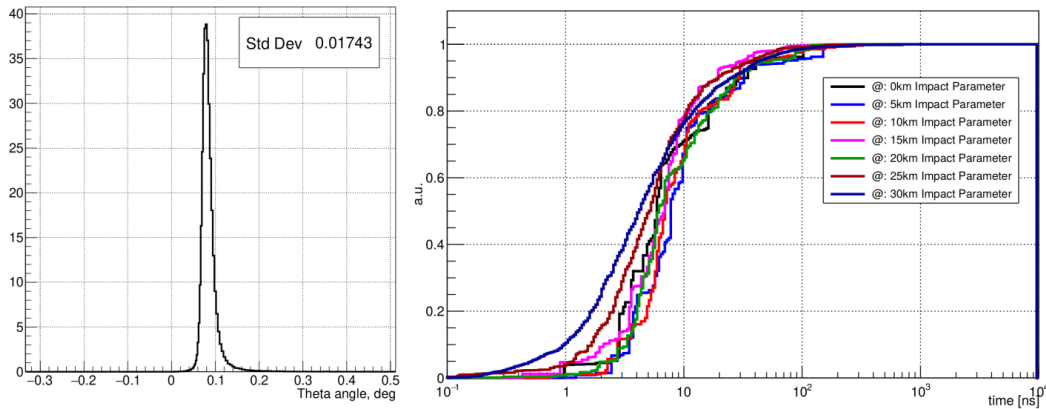


Figure 12: **Left** : Photon angle distribution for a proton of 100 PeV with respect to the shower axis seen by the telescope pointing in the direction of this axis. **Right** : Cumulative distribution of the Cherenkov photons as a function of time from the first one emitted in the direction of the telescope.

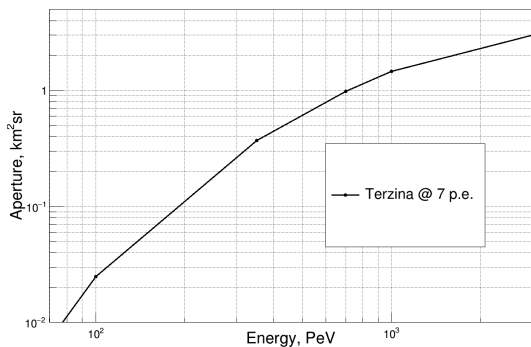


Figure 13: The expected aperture for Terzina versus proton energy during the first year of operation.

(forming a cluster). If a cluster is found, the event is validated and the analog to digital conversion is performed, otherwise the event is discarded.

We decide to assign the same data rate to the two triggering mechanisms, namely 1/2 of the maximum rate each. In particular, considering the aforementioned data

transmission limit, the rate per triggering mechanism is set to 120 Hz. We assign the same rate to the two triggering mechanisms because the expected data rate of UHECRs hitting 1 or 2 pixels is about equal. Then, from simulation we evaluate the thresholds corresponding to this rate for both cases. Regardless of whether the event is validated or discarded, the hit-map is used to increment counters to monitor the camera background.

5.2 Camera monitor

The camera monitor based on hit-maps for low and high thresholds, aims to monitor the average background rate in the two parts of the camera: the upper row of 5 arrays+ASICs in the camera plane will be sensitive to the Earth region and so to UHE neutrinos, but also to undesired blind occurrences due to storms or city light pollution; the lower part of the camera plane will be sensitive to the limb. Very recent changes in the designing of the read-out system opens the possibility to store on the FPGA the hit-map after the high-threshold trigger is satisfied. The single pixel hit-map is less vulnerable, with respect to dou-