CERENKOV PHOTON SPATIAL DISTRIBUTIONS,FLUCTUATIONS AND INTENSITIES FOR DIFFERENTIATION BETWEEN γ AND HADRON SHOWERS

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The lateral distribution of γ showers is very different from that of cosmic ray hadron showers in having a flat region upto 130 meters from the core. Further, γ showers have less density fluctuations compared to hadron showers. A monte carlo program generated for hadron and γ showers with these inputs for the Pachmarhi Atmospheric Cerenkov Telescope shows the use of lateral distribution parameters increases the Signal to Noise ratio significantly. A typical exposure of 10 nights for a standard candle like Crab nebula gives a 25 sigma signal with the use of this parameter. Further it is shown that rejection criteria based on density fluctuations also considerably increases the signal to noise ratio. Another interesting outcome of these calculations is that the mean Cerenkov light (measured in pulse heights) is a factor of 50 to 100 percent higher for a mean $\gamma-$ ray event triggering the telescope. This factor also improves further rejection of proton events.