

## **GAMMA RAY AND HADRON GENERATED ČERENKOV PHOTON SPECTRA AT VARIOUS OBSERVATIONAL ALTITUDES**

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We study the propagation of čerenkov photons generated by Very High Energy  $\gamma$ - rays and hadrons in the atmosphere. The photon production height distributions are estimated from semi-empirical methods and compared with those derived by standard simulation techniques. It is found that the derived production height distributions agree very well with those generated by the simulations at all primary energies and for both  $\gamma$ - ray and hadron primaries. Incident spectra at various observation altitudes are then derived after applying wavelength dependent corrections due to photon attenuation in the atmosphere during their propagation through the atmosphere to the observation level. The incident photon spectra are found to be both altitude and primary energy dependent. The peak of the incident spectrum shifts towards shorter wavelength with increasing altitude of observation for a given primary. Also the peak of the photon spectrum seems to shift towards shorter wavelength with increasing primary energy at a given altitude. The fraction of UV component of incident Čerenkov spectrum is estimated both for  $\gamma$ - ray and hadron primaries at various observation altitudes and energies. Hadron generated Čerenkov spectra are richer in UV light at higher altitudes. Thus the fraction of UV to visible light in the Čerenkov spectrum could be a useful parameter to separate  $\gamma$ - rays from cosmic rays specially at lower primary energies. Recent measurements of the UV fraction carried out at Pachmarhi using UV sensitive phototubes will be presented.