PACHMARHI ARRAY OF ČERENKOV TELESCOPES

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Pachmarhi Array of Čerenkov Telescopes (PACT) has been designed to search for TeV $\gamma-$rays using the wavefront sampling technique. PACT consists of 25 telescopes deployed over an area of 80 $m \times 100$ m, while each telescopes consists of 7 parabolic reflectors with a fast phototube behind a 3° (FWHM) mask at the focus of each of them. Photon density and arrival time (correct to a quarter of a nanosecond) are measured at six of the seven mirrors. The energy threshold and collection area of the array are estimated from a Monte Carlo technique using the measured event rate to be $\sim$ 1 TeV and 10^5 m^2 respectively. Recent engineering runs taken from this array enable us to calculate the accuracy by which arrival angle for a near vertical shower can be estimated to be 0.1° around the threshold energy. This could deteriorate to $\sim$ 0.12° for showers at around 30°. The limiting angular accuracy will improve with increasing primary energy because of the increased number of degrees of freedom. The sensitivity of the array for a 5σ detection of $\gamma-$ray signal has been estimated to be $\sim 4.1 \times 10^{-12}$ $photons\ cm^{-2}\ s^{-1}$, for an on source exposure of 50 hrs. While calculating this it is asumed that 99.75% of the off-axis hadronic events could be rejected from directional information and nearly 75% of the on-axis hadronic events could be rejected using species sensitive measurements like the photon density fluctuations. In addition, it is assumed that $\sim$ 66% of the $\gamma-$rays are lost in the hadron rejection process. Consequently, the continuum emission from the Crab nebula could be detected at 5σ level during an on-source exposure of 4 hours.