

THE AVERAGE MASS NUMBER OF PRIMARY COSMIC RAYS AROUND THE KNEE REGION DERIVED FROM GRAPES III ARRAY AT OOTY

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We analyzed one year data on air showers (3×10^8 showers with $10^4 < N_e < 10^6$) observed with the GRAPES III experiment during 1999 and 2000. The shower array consists of 217 scintillation detectors (1 m^2 each) and 16 muon detectors (35 m^2 each). The very large area (560 m^2) of the muon detectors, gives good statistics for estimating the number of muons even for small air showers. We present the following results; muon lateral density distribution, relation between muon size and electron size and between muon multiplicity distribution and shower size. These results are compared with expectations from simulation (CORSIKA code with QGS Jet model) for primary energy between 10^{13} eV and 10^{15} eV. We find that the model with gradual increase in average mass number with increasing primary energy fits well our observed data. The energy spectrum of primary cosmic rays deduced from muon and electron data is also presented.