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Detailed study on lateral density distribution of electro-magnetic component of air showers observed with highly packed array of Grapes III

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Abstract. The air shower array of the GRAPES III consist of 217 scintillation detectors (each 1 m^2) and detectors are arranged with 8m separation. Using this highly packed array of GRAPES III, detailed analysis on the lateral structure of electro-magnetic component in air showers has been conducted for shower size between 5×10^3 to 10^6. About 3×10^8 air showers are analyzed. These results are compared with the expectations from Monte Carlo simulations (Corsika s QGS Jet model). Their characteristics were examined carefully and are compared with other group s results. The meaning of the age parameter of NKG function are investigated thoroughly and correlation between longitudinal development and lateral density distribution are discussed. Also presented is the mass dependency of lateral structure of the electro-magnetic component and possible usage of the age parameter together with muon size to identify the nature of primary particles. The observed electron size distribution is discussed.

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