COMPARISON OF BIG EVENT WITH CALCULATIONS
OF THE AIR SHOWER DEVELOPMENT

Niwa,M., Misaki,A. and Matano,T.
    Department of Physics, Saitama University,
    338 Urawa, Japan
Honda,K., Tsushima,I., Kawasumi,N. and Hashimoto,K.
    Department of Physics, Yamanashi University,
    400 Kofu, Japan

ABSTRACT

We calculate high energy hadrons and electron-photons in air showers at various stages of developments.

We use the numerical calculation for solving the diffusion equation for nuclear cascade following Dedenko and the analytical calculation for cascade shower induced gamma rays. From these calculation, we can get the longitudinal development of high energy hadron and electron-photon compo- nent, and energy spectra of these components at verious depth of air shower development. The total number of hadron(N_H) and electron-photon component(N_γ) are related according to stages of air shower development and primary energy as shown in Fig.1. From such a figure, we can understand the relation between both components. We can show the relation of the total energy of hadron and electron-photon component above the threshold energy as Fig.2. The energy balance between both components is also useful parameter to study high energy events accompanying air showers. The relation of N_H and fractional hadronic energy($\Sigma E_H^\gamma/(\Sigma E_H^\gamma + \Sigma E_\gamma)$) is calculated like Fig.3. This relation is helpful to understand the stage of air shower development(t) and primary energy(E_P).

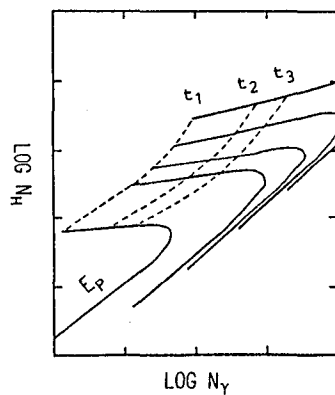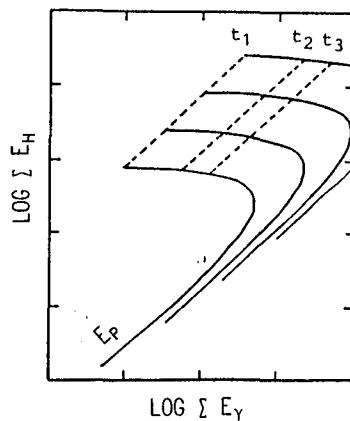These calculations has been done and compared with experimental results,especially Big event.
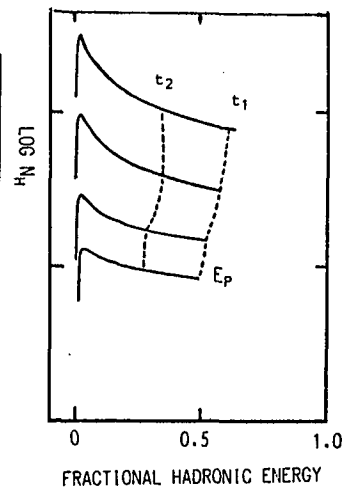
Fig.1

Fig.2

FRACTIONAL HADRONIC ENERGY

Fig.3