

A PHENOMENOLOGICAL MODEL OF MULTIPLE PARTICLE PRODUCTION AND HIGHEST

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We examine how the nuclear interaction characteristics -- increasing cross section of hadron-air collisions, energy distribution of produced particles in multiple particle production, etc. -- affect the development of air showers in 10^{18} - 10^{20} eV region.

The energy distribution of produced particles, formulated by the data of direct observation, shows violation of the Feynman scaling law at high energies.

We show that the energy distribution has the largest effect to the highest energy air showers at sea level among the nuclear interaction characteristics and that the formulated energy distribution does not describe the highest energy air showers.