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About the possible mechanism of the formation of overdue particles at interactions in the energy range higher than 10^{15} eV

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Abstract. In a number of experiments on research of hadron components of EAS with E$> 10^{15}$ eV the effect of hadron delay concerning the EAS front on time more than 500 msc is found out. The experimental data are received on Tien Shan installation with the neutron monitor with the multiplicity more than 1000.In the present work the attempt of an explanation of the mechanism of a unusual course of temporary recession of intensity of neutrons for showers with $Ne > 106$ is undertaken. With this purpose all spectrum of possible mechanisms of evaporation of neutrons is considered:

1 Division of nucleuses by neutrons and charged particles;

2 Huge dipole resonance caused by gamma-quanta with energy Eg=10-25 MeV;

3 Nuclear reactions going through the stages of a compound nucleus;

4 Direct and preequalibrium nuclear mechanisms.

As a result of the analysis is shown, that the behaviour of distribution of neutrons on time of a delay up to E $0 < 10^{15}$ eV is adequately described by the mechanism of the huge dipole resonance. At the same time, the abnormal course of temporary delay of neutrons in EAS with E$> 10^{16}$ eV managed to be received in the frameworks of multicluster model of a nucleus. According to the concept of the given model, in an interval of time from the moment of passage of EAS front $\sim$ 300–500 msc the exited nucleuses remove excitation by the emission of nucleon clusters and only in time T$>$ 500 msc, by lowering energy of excitation, let out neutrons.