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EAS data at the mountain level and a shape of the CR spectrum beyond the break

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Abstract. In the most works which deal with EAS (extensive air showers) the CR energy spectrum E0 is deduced by means of the model defined dependence $E_0 = aN_e^{\alpha}$. An electron total number N_e is evaluated by the integral $N_e \sim \int_{r_{\min}}^{r_{\max}} r f(r) dr$, where $f(r)$ is an electron LDF (lateral distribution function). This work shows, that the main EAS spectrum peculiarity in the range $N_e \geq 10^7$ (Experiment "Hadron", Tien-Shan, p=685 g/cm^2) is connected with increase of the young EAS number, which partly have LDF close to $f(r) \sim 1/r^2$ (age parameter $s \sim 0$ for $f(r)$ approximation by the NKG-functions). This case a divergency of the N_e integral for $r_{\min} = 0$ can distort the shape of EAS (CR) spectrum. A value of the arising errors is discussed. A final analysis of the experimental data permits to conclude that EAS spectrum has local maximum at $N_e \sim 10^9$, which results in a decrease of the EAS spectrum slope for $N_e \geq 10^7$ (inverse break). A local maximum can arise because of the additional CR component in the range $E_0 \geq 10\,\text{PeV}$.

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