THE INFLUENCE OF BARYON STOPPING ON COSMIC RAY SHOWERS

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A new feature of hadron production in nuclear collisions is the large stopping of the participating nucleons. Experimental data demonstrating this effect have been presented by the NA35 Collaboration at the CERN SPS. In order to incorporate the effect into models like the Dual Parton Model (DPM), new diquark breaking diagrams were proposed in [**?**, **?**].
The new diagrams were investigated in detail in [**?**], where also their implementation into multistring fragmentation models was discussed. Introducing the new baryon stopping mechanisms into DPMJET we get an improved agreement to data in different sectors: (i) The Feynman–x distributions of leading protons. The leading particle production is very important for the Cosmic Ray cascade simulation. (ii) The net–baryon (B – $\bar{B}$) rapidity distributions in hadron–nucleus and nucleus–nucleus collisions. These are the data on the enhanced baryon stopping discussed above. (iii) The production of hyperons and anti–hyperons in nuclear collisions.
The presence of the new baryon stopping diagrams modifies considerably the extrapolation of multistring models to Cosmic Ray energies. The energy fractions carried by baryons decrease as compared to those obtained with models without the new diagrams. The effect of the enhanced baryon stopping on air shower simulations is discussed.

References

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