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Baryon Number Flow in High-Energy Collisions

Baryon Number (BN) is associated with a specific topology of gluonic fields, rather than with the valence quarks. The BN is frequently confused with the difference between the quark and antiquark distributions in the hadron. However, that they have quite different x -dependences. The BN asymmetry distribution is nearly constant at small x , while valence $q(x) - \bar{q}(x) \propto \sqrt{x}$. The x -independent BN asymmetry leads to the energy independent $\bar{p}p$ annihilation cross section, and to rapidity independent BN stopping at high energies. Measurements of baryon asymmetry at small x in ep collisions at HERA confirms this expectation. The gluonic mechanism of BN stopping also increases the production rate for cascade hyperons in a good accord with LHCb data. The BN asymmetry at mid-rapidities in heavy ion collisions is substantially enhanced by multiple interactions.

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