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Bare Proton Contribution to the $\bar{d}/\bar{u}$ Ratio in the Proton Sea[1]

AARON FISH, Seattle University — From perturbative processes, such as gluon splitting, we expect there to be symmetric distributions of $\bar{d}$ and $\bar{u}$ partons in the proton. partons in the proton. However, experiment has shown an excess of $\bar{d}$ over $\bar{u}$. This has been qualitatively explained by the Meson Cloud Model (MCM), in which the non-perturbative processes of proton fluctuations into meson-baryon pairs, allowed by the Heisenberg uncertainty principle, create the flavor asymmetry. The x dependence of $\bar{d}$ and $\bar{u}$ in the nucleon sea is determined from a convolution of meson-baryon splitting functions and the parton distribution functions (pdfs) of the mesons and baryons in the cloud, as well as a contribution from the leading term in the MCM, the "bare proton." We use a statistical model to calculate pdfs for the hadrons in the cloud, but modify the model for the bare proton in order to avoid double counting. We evolved our distributions in Q^2 for comparison to experimental data from the Fermilab E866/NuSea experiment. We present predictions for the $\bar{d}/\bar{u}$ ratio that is currently being examined by Fermilabs SeaQuest experiment, E906.

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