Ratio of Kaon and Pion valence-quark parton distributions[1] JEF-
FREY TIBBALS, Seattle University — The K^+ and π^+ are composed of two valence
quarks each, $u\bar{s}$ and $u\bar{d}$, respectively. The ratio of momentum fractions carried by
the up valence quarks, u_K/u_π, has been measured by Badier et al. [1], and found to
decrease with increasing Bjorken x. I extend the statistical model of Zhang et al. [2]
to calculate the parton distribution functions for the K^+ meson and the π^+ meson.
I consider the π^+ and K^+ as an infinite series expansion of quark-gluon Fock states.
The probabilities of each state were calculated using detailed balance and the three
processes $q \rightleftharpoons qg$, $g \rightleftharpoons q\bar{q}$ and $g \rightleftharpoons gg$. I find a sea asymmetry of $\bar{d} - \bar{u} \approx 0.265$ in
the K^+, but no sea asymmetry in the π^+. I used the RAMBO program to produce
a Monte Carlo simulation for the momentum distributions of the n- parton Fock
states of both K^+ and π^+, which determine the momentum distribution functions
of the mesons. I compare the ratio of momentum fractions carried by the up valence
quarks in each meson, u_K/u_π, to the experimental results, and to other theoretical
calculations.

[1] J. Badier et al., Phys. Lett. B 93 (1980) 354.
[2] Y.-J. Zhang et al., Phys. Lett. B 523 (2001) 260.

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