Correlated nucleons in nuclei ATHANASIOS PETRIDIS, DREW
FUSTIN[1], AARON FRAZIER, Drake University, JAMES VARY, Iowa State University — Jefferson Laboratory data (K. Egiyan et. al., talk given at the April 2004
meeting of the American Physical Society) indicate that there exist short-range
correlations in nucleons bound in nuclei leading to a step-like behavior of the heavy-to-light nuclei cross section ratios versus the Bjorken-x in deeply inelastic scattering
(DIS). A possible theoretical model to interpret this effect is the formation of multi-quark clusters in the nucleus. These are due to the overlap of nucleon wavefucntions
leading to six, nine, or more valence quark color singlets. A semiclassical algorithm
has been developed to calculate the multi-quark-cluster probabilities for arbitrarily
large nuclei. Two-body correlations are introduced and the results are compared to
those obtained with the independent particle model. The calculated probabilities
are close to those needed to fit the DIS data as well as data on Drell-Yan production
and J/Ψ suppression in nucleon-nucleus collisions.

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