Ground state correlations in deep inelastic scattering.

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We determine the effect of ground state correlations in e-p deep inelastic scattering (DIS). It is believed that the account for the off-shellness of initial parton improves the result of the conventional formalism, which treats all partons on-shell. The partons are driven off shell by their interaction and nonvanishing transverse momentum. In particular, the effect is expected to be large in the region of small Bjorken x, where the parton distributions have a steep rise.

To study this question, we calculated the cross sections of several processes. The interaction of partons was taken into account by dressing the incoming quark lines with spectral functions, which can be calculated self-consistently.

Putting the incoming quark off mass shell appeared to cause little deviations of structure function F_2 from parton model result for all x and reasonable widths of mass smearing. This result is natural, because F_2 is an inclusive characteristic. While the ground state correlations significantly effect parton momentum distribution only in high momentum tail. The information on this fast moving partons can not be extracted from inclusive experiments.

The results are different semi-exclusive processes. In case of jet production and Drell-Yan process the high momentum cut can be done and thus the information about parton interactions can be obtained.