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The EMC effect of light-nuclei within the light-front Hamiltonian dynamics

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We present the description of the structure of light-nuclei (H2, H3, He3 and He4) in impulse approximation within the Light-Front approach [1,2], retaining nucleonic dof, only. In particular, the latter has been applied to investigate the reaction mechanism of polarized and unpolarized deep inelastic scattering (DIS) on nuclear targets, in the valence region and in the Bjorken limit [3,4,5]. In this framework, Poincaré covariance is preserved as well ass macroscopic locality, number of particles and momentum sum rules. The main theoretical ingredient of our calculations is the LF nuclear spectral function properly related to the relative momentum distribution. This quantity has been used to realistically evaluate the structure functions, of light nuclei. The spin independent structure functions have been used to predict the European Muon Collaboration (EMC) effect. For the He3 target, our results are in good agreement with data [3,6,7]. For He4 a sizable effect has been found [4] but our calculation overestimate the data. Results, in the valence region, are found to be rather independent with respect to the use of different parametrizations of the nucleon DIS structure functions and that of nuclear two- and three-body potentials [3,4]. Finally, in Ref. [5] the spin dependent He3 Structure functions have been calculated and results compare very well with data. These results are fundamental for the experimental programme of the present and future experiments, such as the Electron Ion Collider.

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