Are the Medium Modifications of the Nucleon Structure Suggested by a Chiral Quark-Meson Theory Reliable?

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In this contribution the medium modifications of the nucleon structure in a dense matter, suggested by a chiral quark-meson theory, are discussed in regard to both quasi elastic (QES) and deep inelastic scattering (DIS) data. In the theory a hybrid NJL model is used in which a Dirac sea of quarks is combined with a Fermi sea of nucleons. The mesons are described as collective $\bar{q}q$ excitations and the nucleon appears as a baryon-number-one soliton of N_c valence quarks coupled to both Dirac and Fermi sea. If the medium density reaches nuclear matter one, the proton radius shows an increase of 19% and the nucleon mass a decrease of 17%. The magnetic moments and axial vector coupling constant are less modified. All form factors show remarkable reduction at finite transfer momenta. The predicted medium modifications are examined in the analyses of experimental data of QES and DIS. In the case of QES the use of the medium modified nucleon form factors within CDFM model improves considerably the comparison with the experimental data for the longitudinal response function. In the case of DIS the medium modified values, in particular the nucleon mass and radius, are consistent with values used in different models considering the EMC-effect.