Relativistic pion loop corrections to the electromagnetic nucleon coupling[1] CHUENG-RYONG JI, North Carolina State University, WALLY MELNITCHOUK, Jefferson Lab — We present a relativistic formulation of pion loop corrections to the coupling of photons with nucleons on the light-front. Vertex and wave function renormalization constants are computed to lowest order in the pion field, including their nonanalytic behavior in the chiral limit, and studied numerically as a function of the ultraviolet cutoff. Particular care is taken to explicitly verify gauge invariance and Ward-Takahashi identity constraints to all orders in the m_π expansion. The results are used to compute the chiral corrections to matrix elements of local operators, related to moments of deep-inelastic structure functions. Finally, comparisons of results for pseudovector and pseudoscalar coupling allows the resolution of a long-standing puzzle in the computation of pion cloud corrections to structure function moments.

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Date submitted: 26 Jun 2013   Electronic form version 1.4