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g_2 JMC - ideas, notes

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w/ Ale B.

Need to understand:

- numerics … in progress (based on h, fit, …)
- BC sum rule breaking
  ↳ OK? (yes, known w/ jet functions it is almost SIDIS ??)
  ⇒ $\tilde{J}_H = 0$?

  ↳ spectral representation

$$\Rightarrow \left| \langle \Omega | \phi(0) W_{[0,\infty]} | \lambda_0 \rangle \right|^2 \propto J(M^2) (\not{p} + M^2) + [\not{n}^+, \not{n}^-] J_3$$

∃ n^+ vector

⇒ in principle Dirac structures with n^+ are possible

QUESTION:

$$J_3(M^2) = \begin{cases} 0 \\ J(M^2) \\ f(M^2) \end{cases}$$

but time reversal invariance implies no single spin asymmetry in inclusive DIS

⇒ expect $\int dM^2 J_3(M) = 0$

Can we calculate in a model (quark model …)

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• why is $\rho(M)\, M \equiv \lambda_1 (M^2)$?

no from field th. pt of view

as in a model;

def ← really? make sure!

$J_2 (M^2) \stackrel{def}{\equiv} \int dz\, z D(z, M^2) = \int dz \int dk_T^2\, z D(z, k_T)\, \delta(M^2 = \dots)$

← why?

NOTE: $\int dM^2\, J_2(M^2) = \int dz \int dk_T\, z D(z, k_T) = \int dz\, z D(z) = 1$

TO DO:

→ • verify BC can be broken by mass effect in general — mass + modelling ??

→ • understand why $J_2(M)(\rho + M)$ → $J_H = 0$
(↪ think about M dependence in spectral functions)

→ • write down well how to cancel gauge breaking & $g_{1T}^{(1)}$

• investigate mass effects in other processes
$e^+e^- \to h, Zh$
SIDIS: where else?