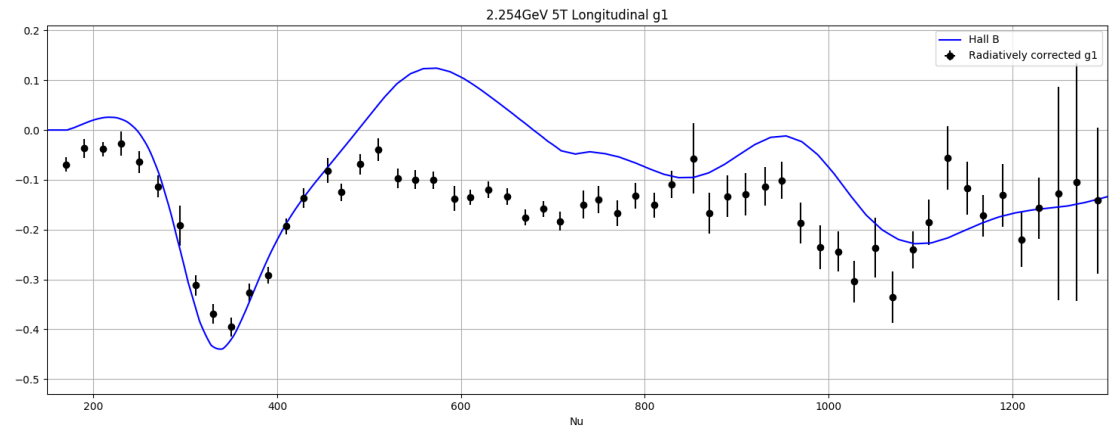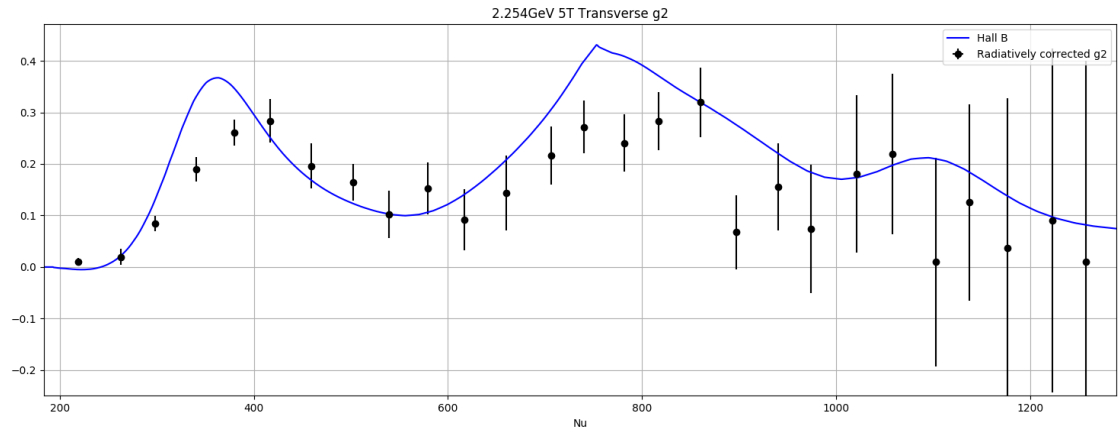# Preliminary Look at Moments of g_2

Toby Badman

5/31/17

- Radiatively corrected g1 and g2 data sets from Ryan, these should be identical between our two analyses moving forward.
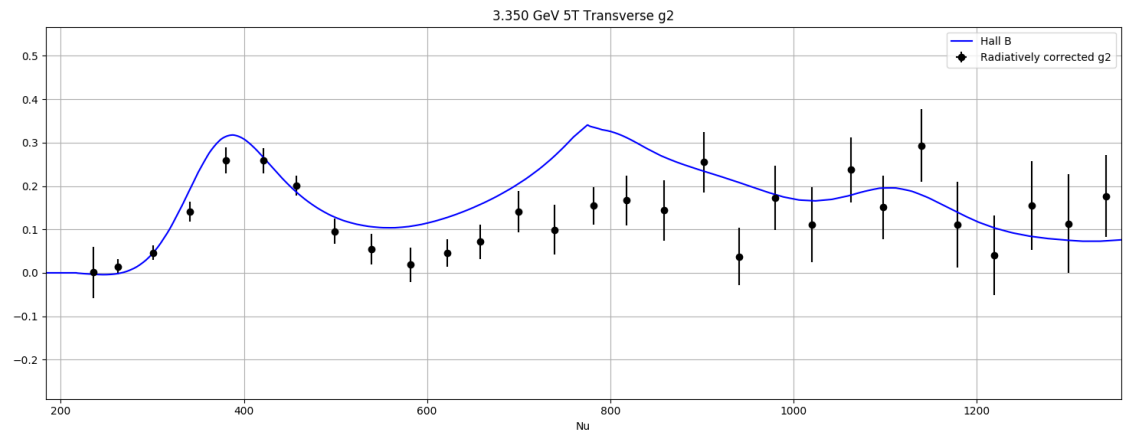
- I extrapolate these to constant Q^2 using the Hall B g1/g2 model (see Ryan's analysis summary slides from May 10 for details)

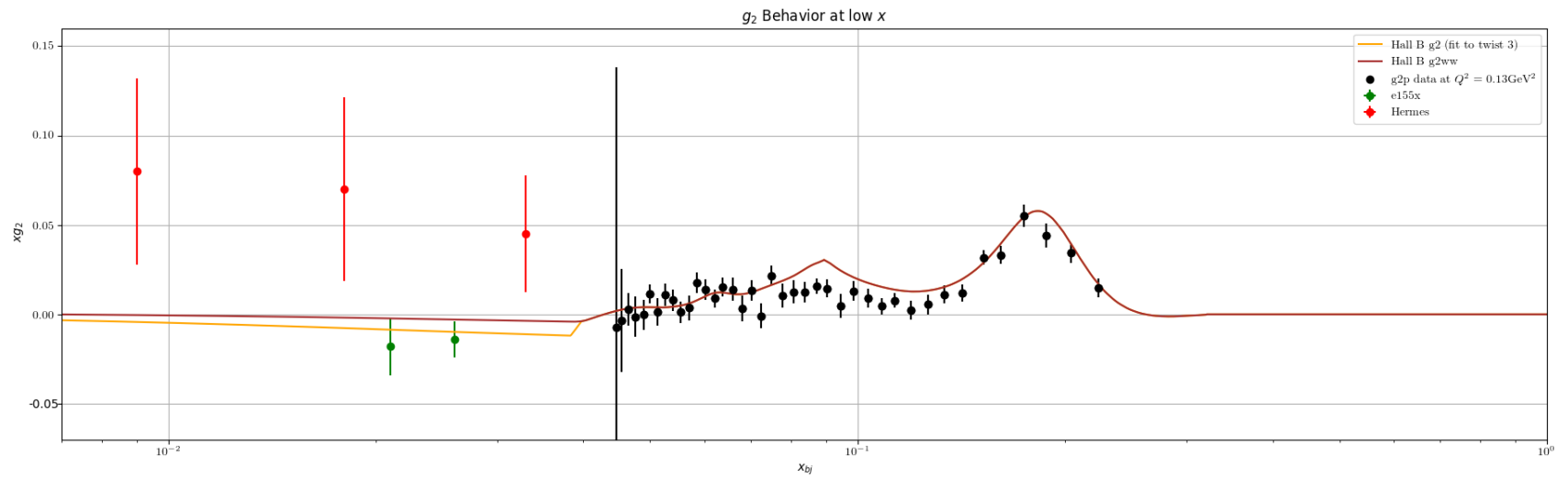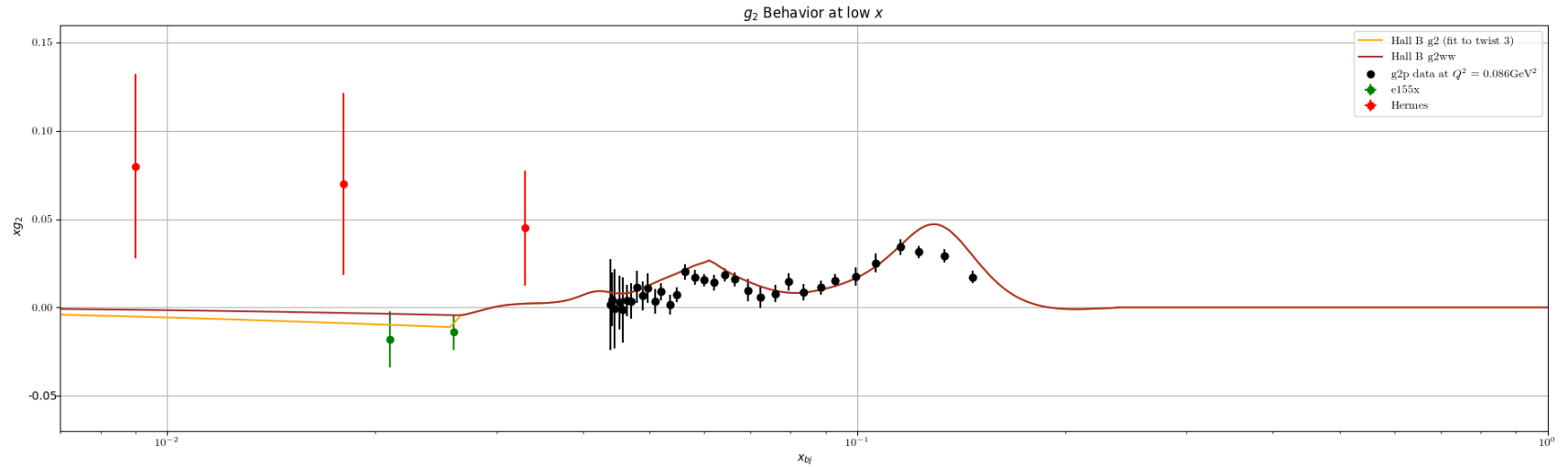- 2.254 GeV 5T Longitudinal: $Q^2 = 0.043 \text{ GeV}^2$

- 2.254 GeV 5T Transverse: $Q^2 = 0.086 \text{ GeV}^2$

- 3.350 GeV 5T Transverse: $Q^2 = 0.130 \text{ GeV}^2$

2.254GeV 5T Longitudinal g1

2.254GeV 5T Transverse g2

3.350 GeV 5T Transverse g2

Estimating the unmeasured region in g_2

g_2 Behavior at low x

Legend:
- Hall B g2 (fit to twist 3)
- Hall B g2ww
- g2p data at $Q^2 = 0.086\text{GeV}^2$
- e155x
- Hermes

g_2 Behavior at low x

Legend:
- Hall B g2 (fit to twist 3)
- Hall B g2ww
- g2p data at $Q^2 = 0.13\text{GeV}^2$
- e155x
- Hermes

Q^2 ranges

- E143:
    $1.49 - 4.55 \text{ GeV}^2$

- E155:
    $1.15 - 27.18 \text{ GeV}^2$

- E155x:
    $0.8 - 8.2 \text{ GeV}^2$

- Hermes:
    $0.38 - 10.35 \text{ GeV}^2$

- SMC:
    $1.4 - 11.8 \text{ GeV}^2$

BC Sum
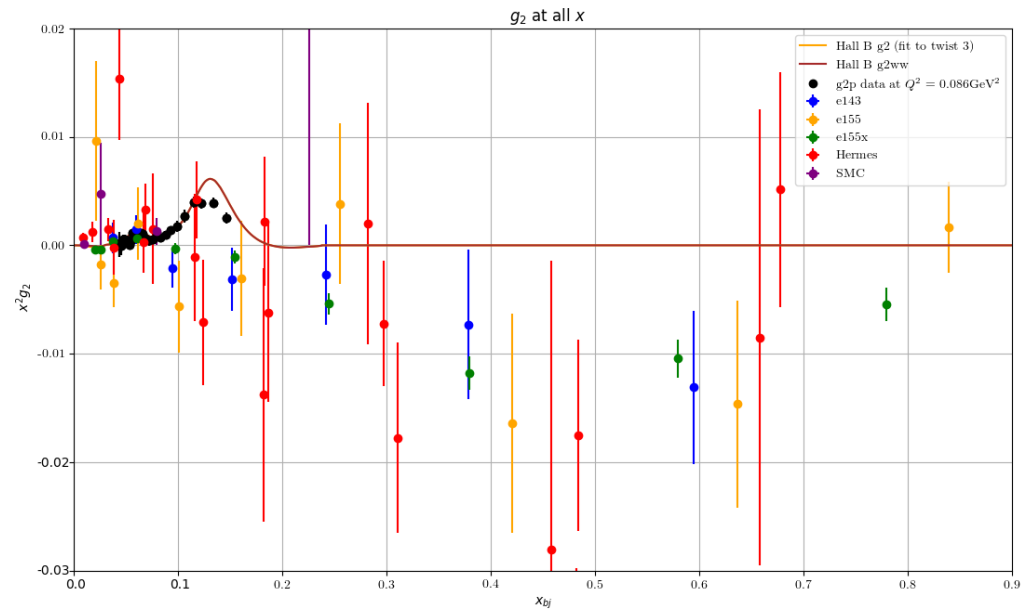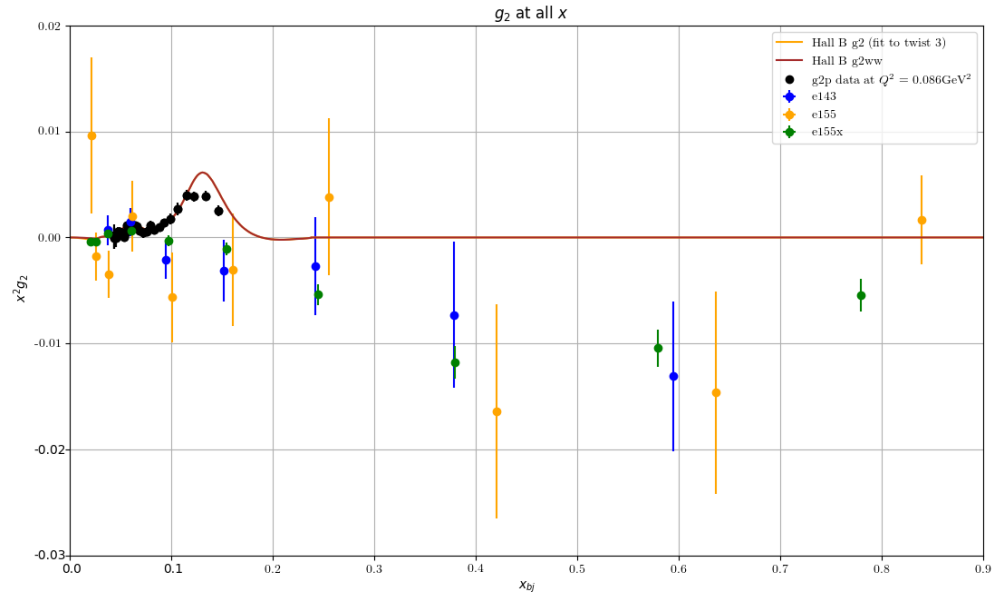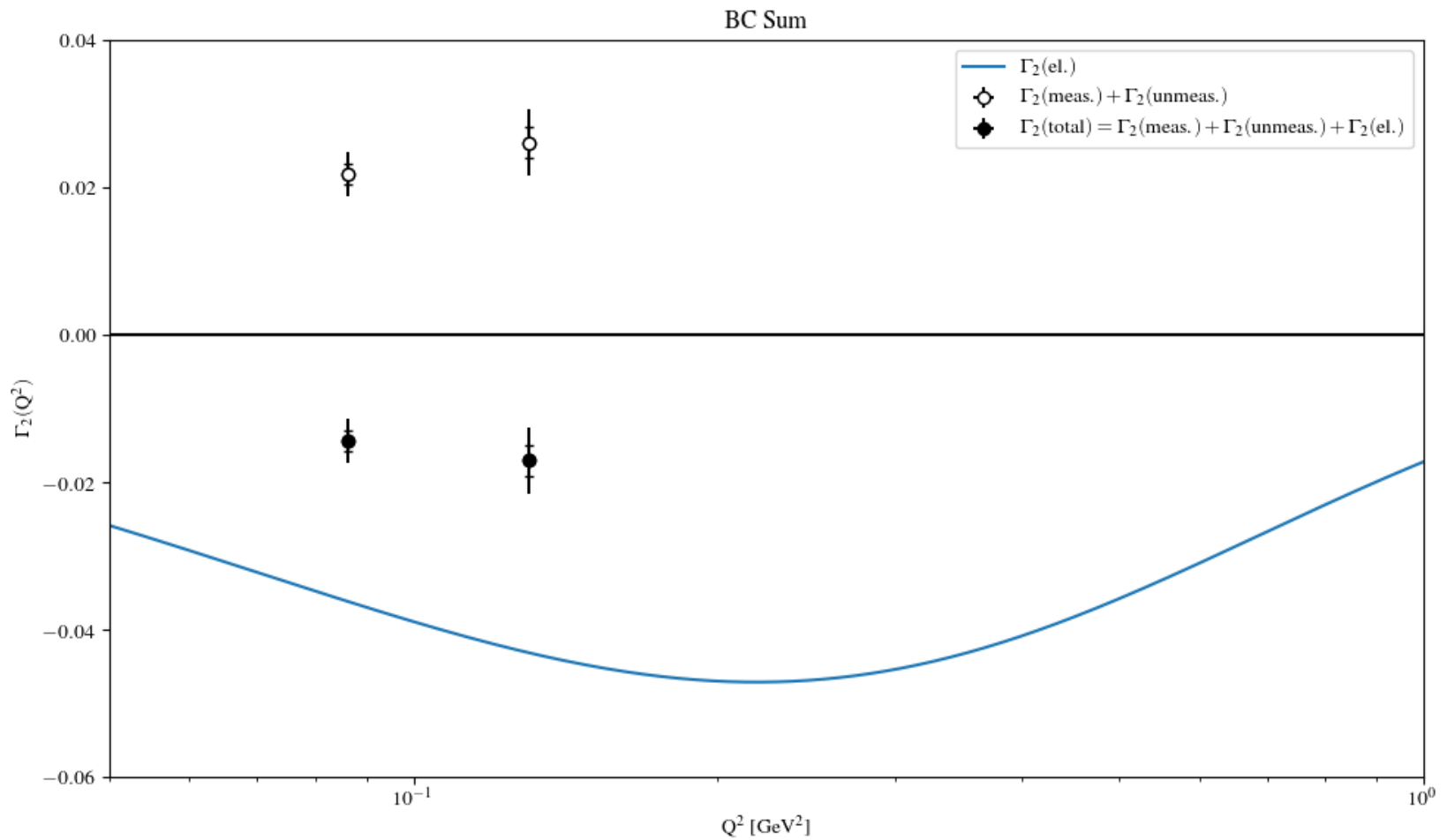
$\Gamma_2(\text{unmeas.}) = g_2 ww$ from Hall B (contributes $\sim < 10\%$ to total)

Proton δ_{LT} Polarizability

$$\delta_{LT} = \frac{16\alpha M^2}{Q^6} \int_0^{x_{th}} x^2\left(g_1(x,Q^2) + g_2(x,Q^2)\right)$$
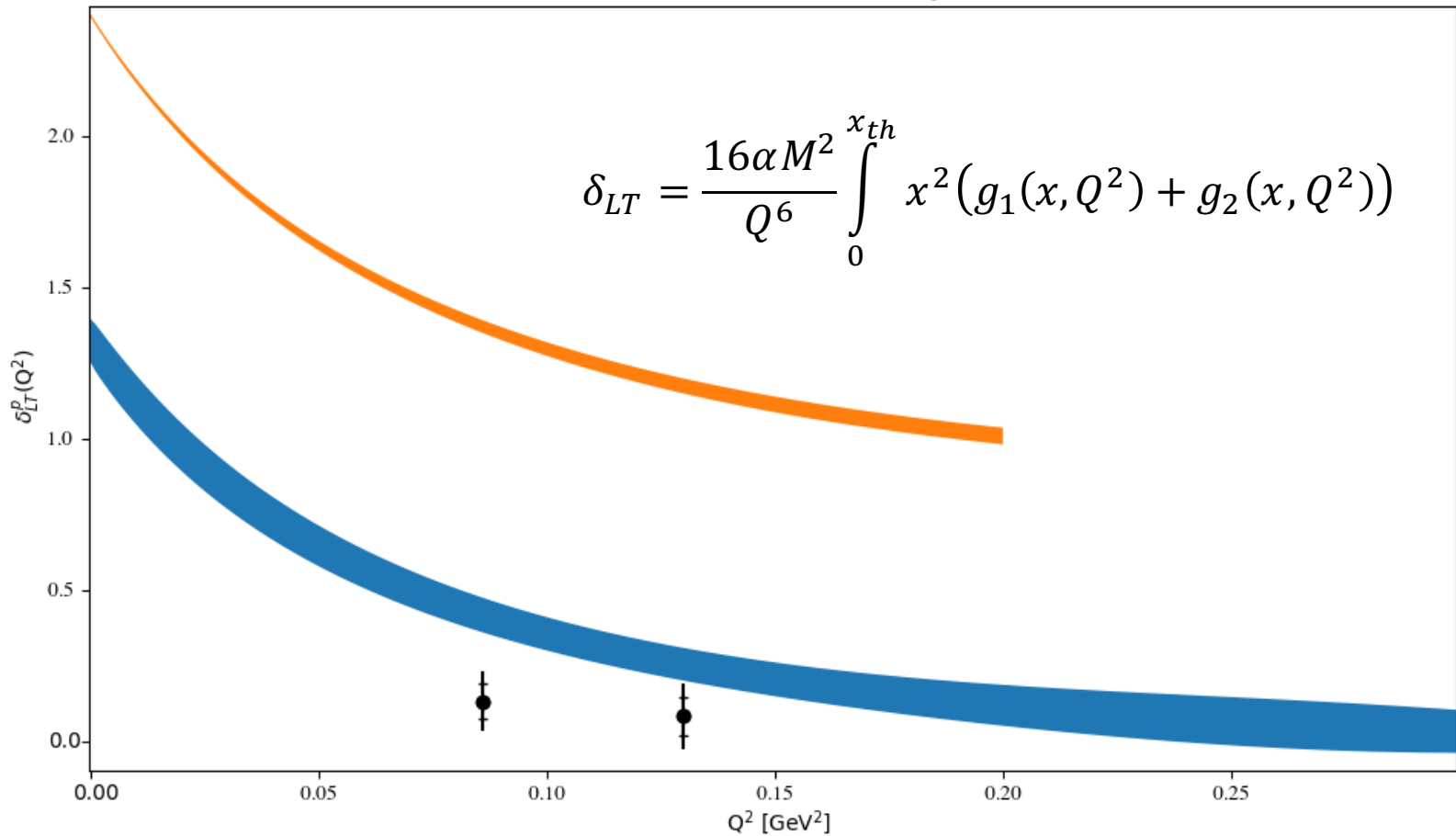
- g_1 currently from Hall B model (will update to include data soon)
- Curves from Meissner and Pascalutsa calculations.