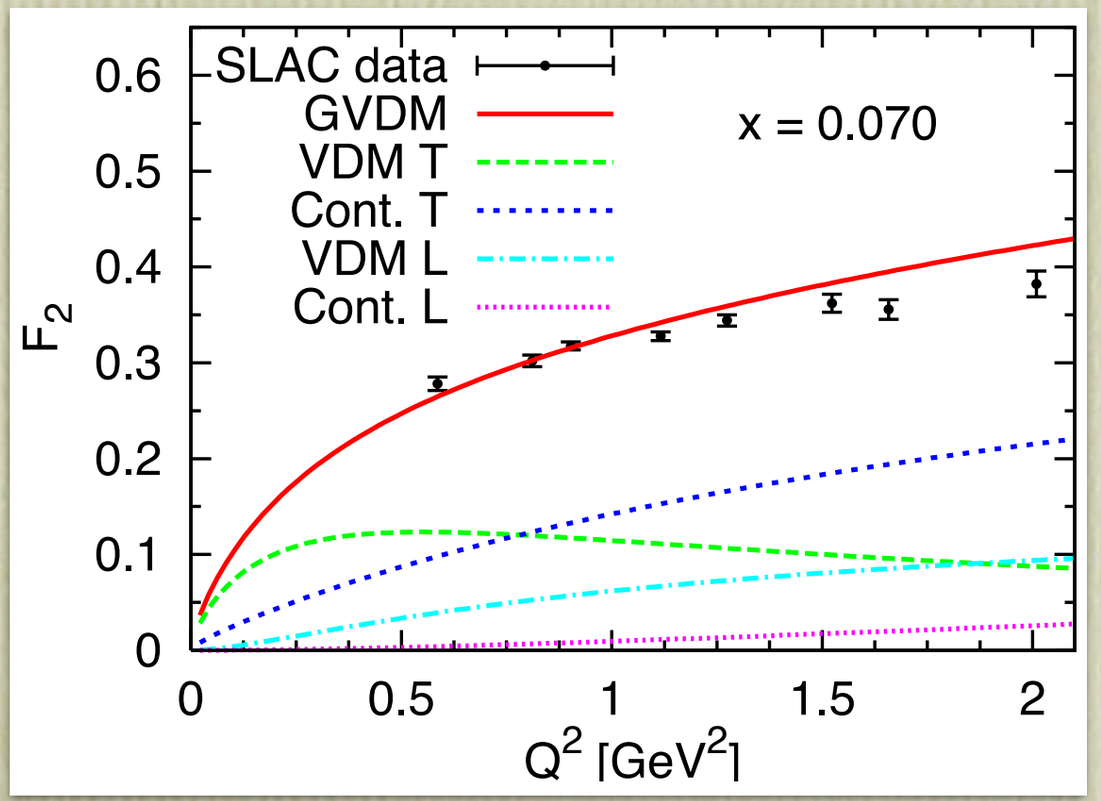
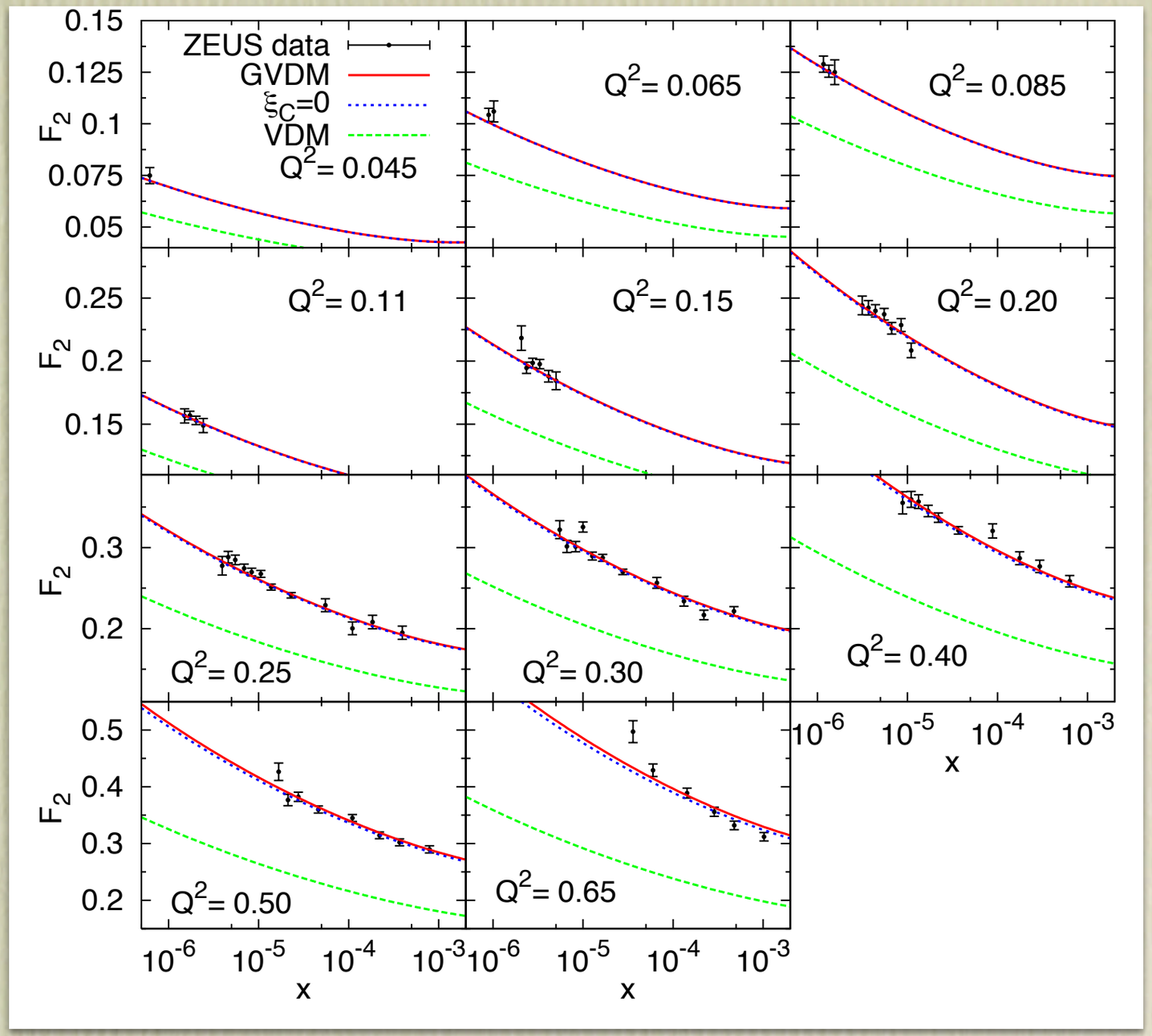
The continuum contribution

Why should there be a continuum part?

- Data tell us that





The simple model (VDM + Continuum) works very well at $Q^2 \lesssim 1.5$ GeV^2
Deviates afterwards; Continuum Longitudinal part stays small at low Q^2

Saturation of the continuum contribution

Evaluate the continuum contribution (= uncertainty!) to γZ-box alone

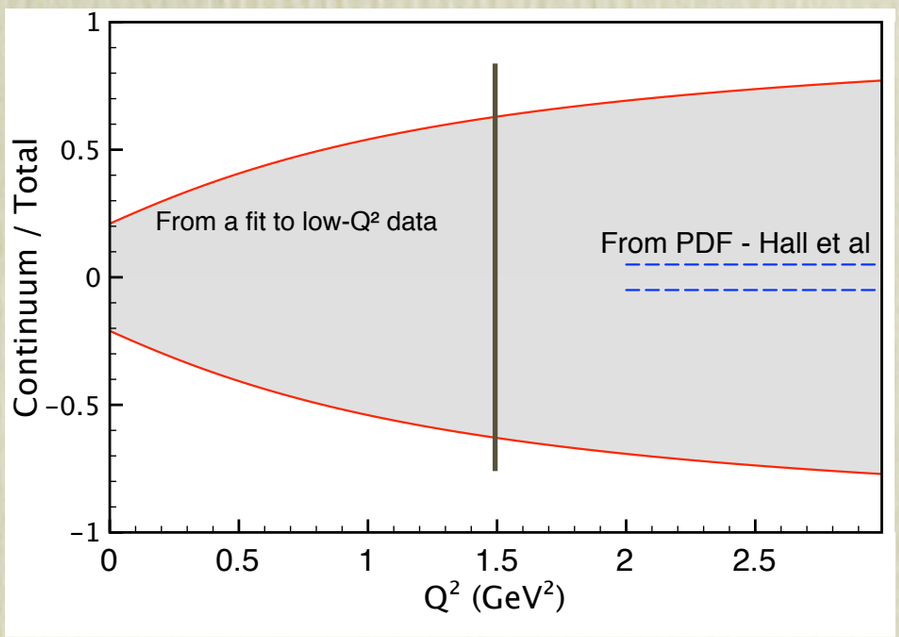
Q-Weak kinematics - in % of 1.92×10^{-3} (continuum)

	W < 2GeV	W < 4GeV	W < 5GeV	W < 10GeV	All W
$Q^2 < 1$ GeV^2	27.6%	42.7%	44.3%	46.4%	46.6%
$Q^2 < 2$ GeV^2	33.3%	55.7%	58.2%	61.5%	62.2%
$Q^2 < 3$ GeV^2	34.9%	61.5%	65.0%	69.3%	70.4%
All Q^2	37.5%	74.5%	81.5%	94.8%	100%

About 38% comes from $Q^2 > 2$ GeV^2

- we don't believe the model there!

Compare Kc=0.65 by Hall et al.



Saturation of the continuum contribution

Tame the continuum above some "critical" Q^2=1.25 GeV^2

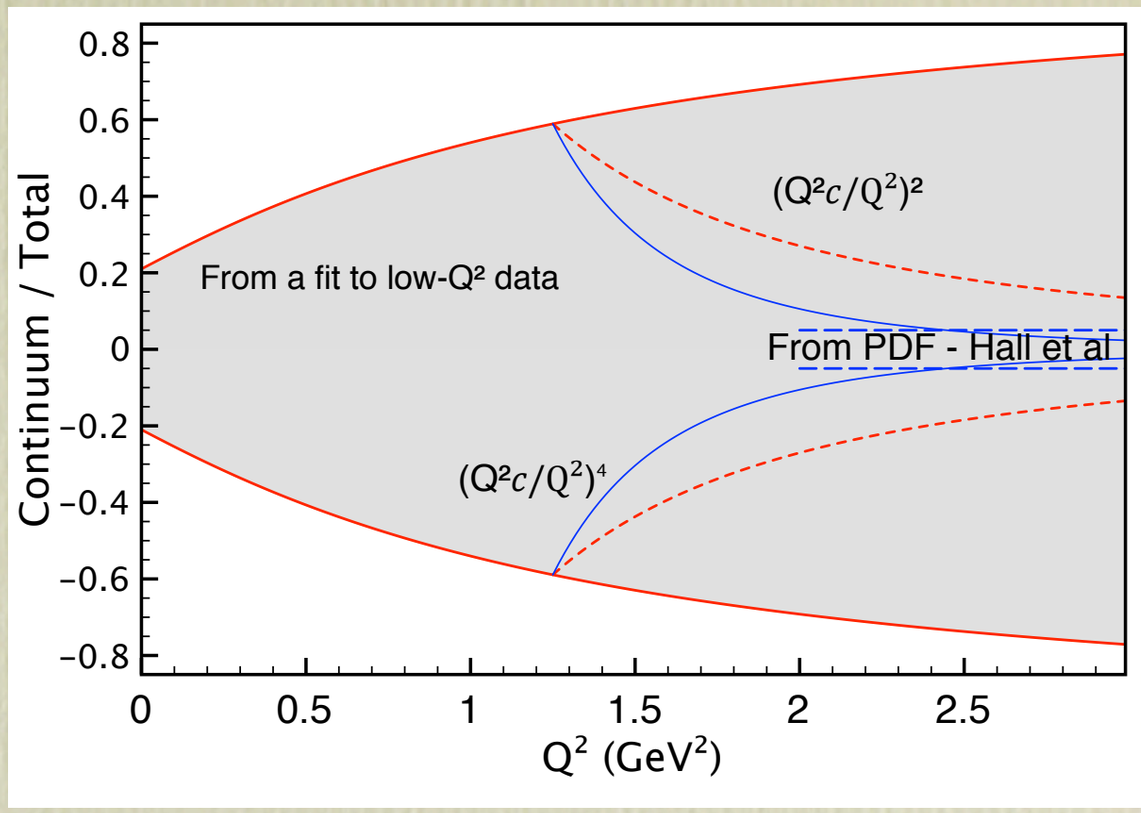
Following Alwall, Ingelman $(Q^2c/Q^2)^a$

Without taming: 1.92×10^{-3}

With taming:

a = 2: $1.92 \times 10^{-3} \rightarrow 1.19 \times 10^{-3}$ (62.0%)

a = 4: $1.92 \times 10^{-3} \rightarrow 1.10 \times 10^{-3}$ (57.3%)



in % of 1.92×10^{-3}

	W < 2GeV	W < 4GeV	W < 5GeV	W < 10GeV	All W
Q^2 < 1 GeV^2	27.6%	42.7%	44.3%	46.4%	46.6%
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All Q^2	37.5%	74.5%	81.5%	94.8%	100%

Isospin of the continuum contribution

Some limiting cases:

- Pure isoscalar (like ω) - $\sigma_{\gamma Z}/\sigma_{\gamma\gamma} = -4\sin\theta^2 w \approx -1$
- Pure isovector (like ϱ) - $\sigma_{\gamma Z}/\sigma_{\gamma\gamma} = 2-4\sin\theta^2 w \approx 1$
- Pure strange (like ϕ) - $\sigma_{\gamma Z}/\sigma_{\gamma\gamma} = 3-4\sin\theta^2 w \approx 2$

At present: $\sigma_{\gamma Z}/\sigma_{\gamma\gamma} = 1 +- 1$ between 2(=strange) and 0 (I=0 + I=1)

It is clear what it should be in DIS: $\sigma_{\gamma Z}/\sigma_{\gamma\gamma}=0.65+-0.14$ (Hall et al.)

What about real photons?