E00-110 reanalysis and long paper preparation

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Outline

- BKM "hot fixes"
- Elastic cross section analysis (preliminary, F. Sabatié)
- Plans for long paper

BKM "hot fixes"

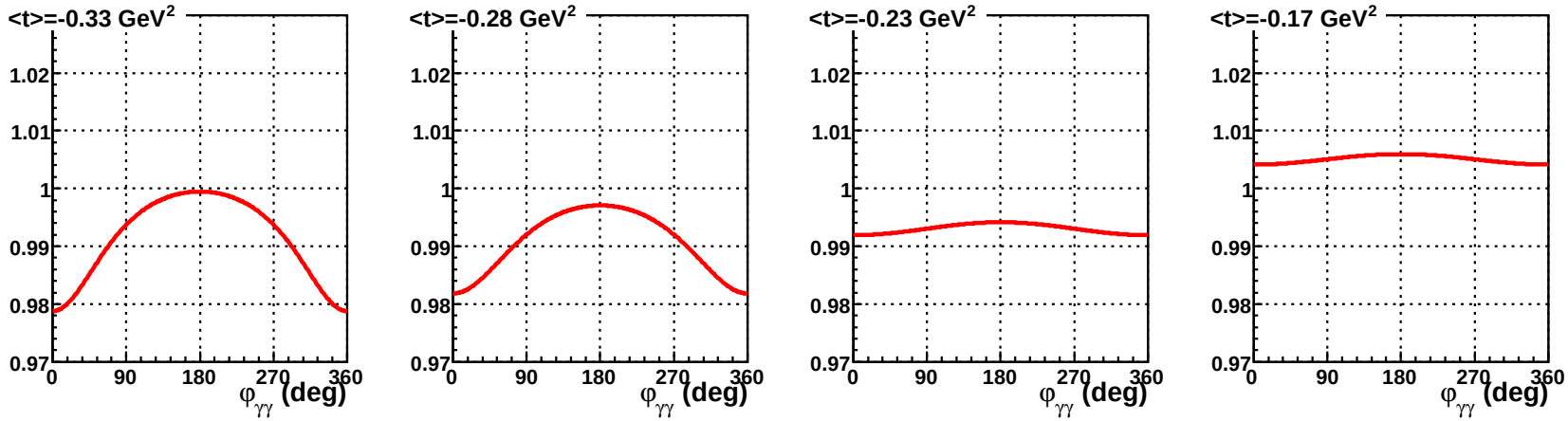
- E00-110 DVCS analysis used BKM[1] DVCS cross section equations to weight the acceptance.
- BKM formalism contained approximations of $\mathcal{O}(t/Q^2)$
- Recently Belitsky and Mulle (2008, eprint 0809.2890) have provided exact equations *for spin-0 target*
- *Some* of the corrections to a spin-0 should be valid for a spin-1/2 target ("hot fixes")

Full reanalysis of E00-110 was done using BKM+"hot fixes" and compared to previous results

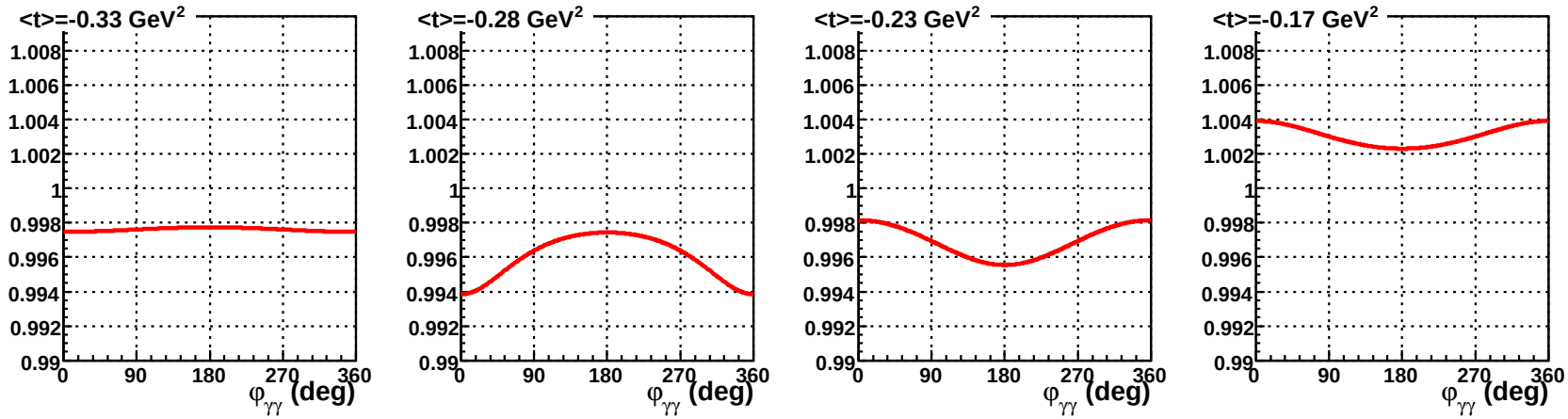
[1] A. V. Belitsky, D. Mueller, and A. Kirchner, Nucl. Phys. **B629**, 323 (2002)

Effet on cross sections (kin 1+2)

$$\frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2002) / \frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2008)$$

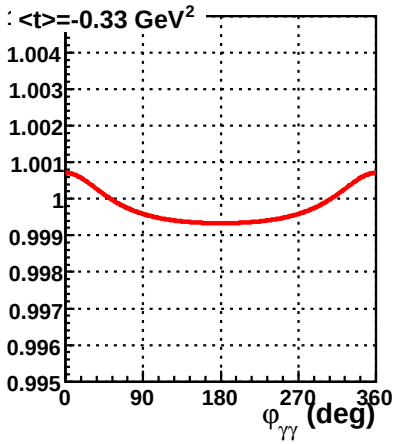


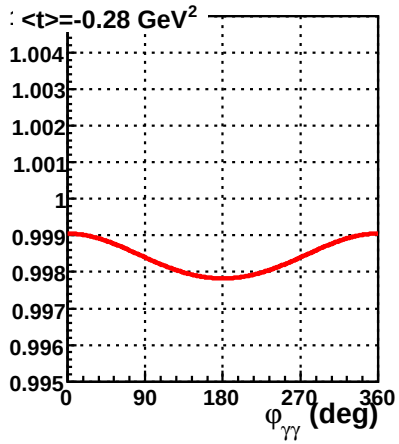
$$\frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2002) / \frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2008)$$

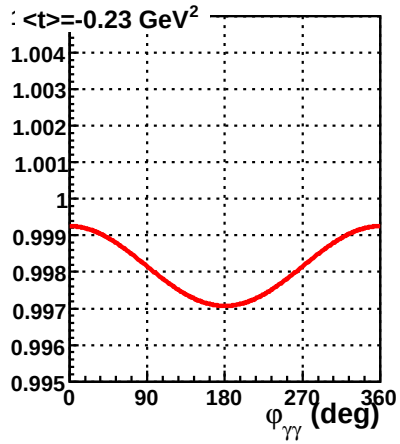


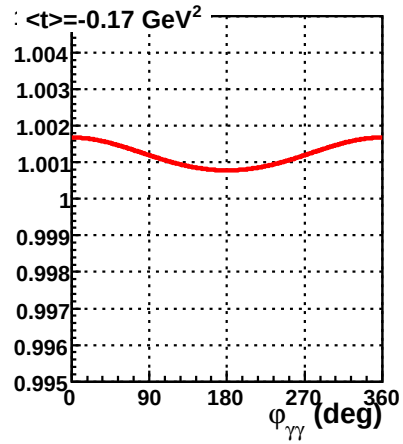
Effet on cross sections (kin 3)

$$\frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2002) \Big/ \frac{1}{2}\left(\frac{d^4\sigma^+}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}} - \frac{d^4\sigma^-}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}\right)(2008)$$

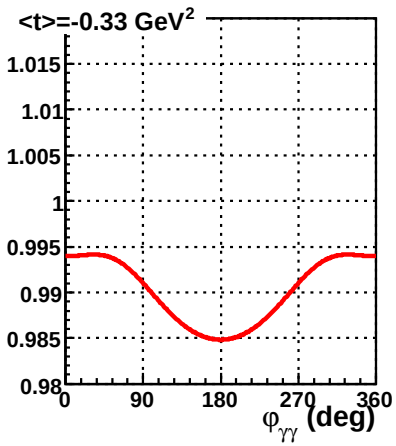


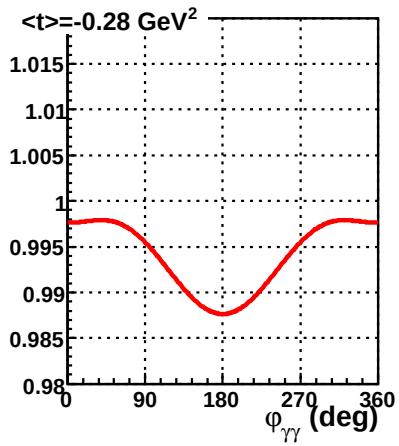


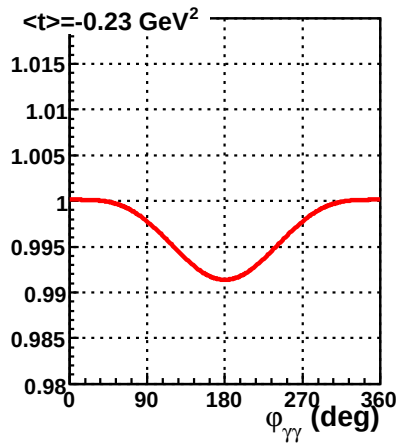


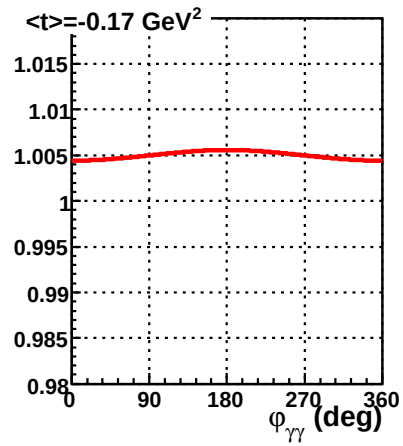


$$\frac{d^4\sigma}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}(2002) \Big/ \frac{d^4\sigma}{dQ^2 dx_B dt d\varphi_{\gamma\gamma}}(2008)$$

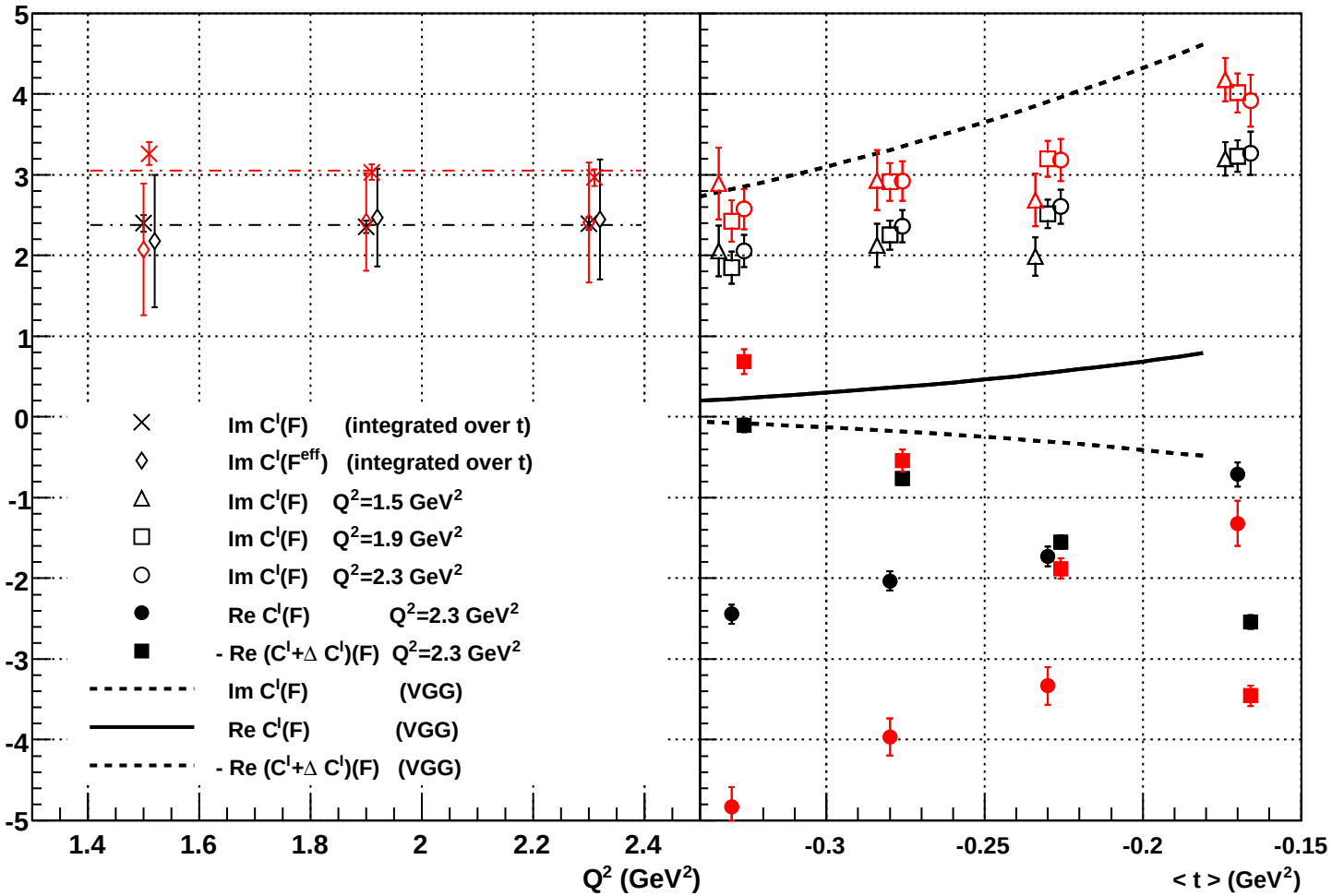






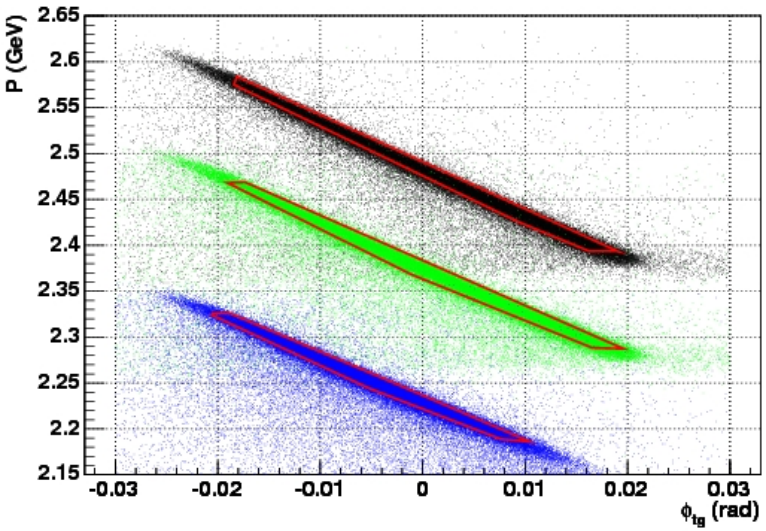


Effet of BKM coefficients

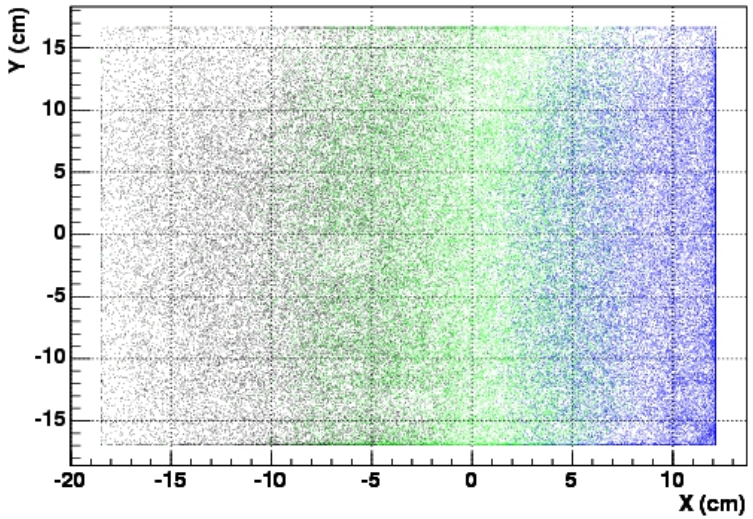


Elastic calibration

Proton in HRS



Electron in calorimeter



- 3 elastic calibrations during the experiment ($\sim$ 10h of beam time each)
- Dedicated runs, HRS in inverse polarity

Acceptance×efficiency check: $ep \to ep$ elastic cross section

Work "underway" by F. Sabatié

Elastic data used to check acceptance

- $\langle Q^2 \rangle = 3.0$ GeV^2

$$\frac{d^2\sigma}{d\cos\theta_e d\varphi} = 0.684 \pm 0.012\,(\text{stat.})\ \text{nb}\cdot\text{sr}^{-1} \qquad \text{(preliminary)}$$

Using Kelly's parametrization of FF: $d^2\sigma = 0.675$ nb $\cdot$ sr^{-1}
(1.1% discrepancy, within statistical uncertainty)

Things TO DO

- Simulation with calorimeter block-dependent resolution (probably using $ep \rightarrow ep\pi^0$ data, as Eric's showed yesterday)
- Reanalyze DVCS data with new simulation
- Reanalyze data with new P. Guichon's formalism ?? (not released yet)

Analysis to do (or redo) before publication

- Finish elastic cross section analysis (candidates?)
  - Check of acceptance/systematics
  - Interesting data to publish
- E00-110 reanalysis
  - Block-dependent simulation
  - New DVCS formalism

Conclusion

- Long paper more and more difficult as E07-007/E08-025 approach
- I think we should make an effort to publish the long paper in 2009 (before starting new round of experiments)
- Pressure on F. Sabatié (our long paper "coordinator")

. . . and also π^0 paper (long due !) to write. . .