RADIATIVE CORRECRTIONS FOR DVCS-3: E12-06-114

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DVICS COLLABORATION

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RADIATIVE CORRECTIONS

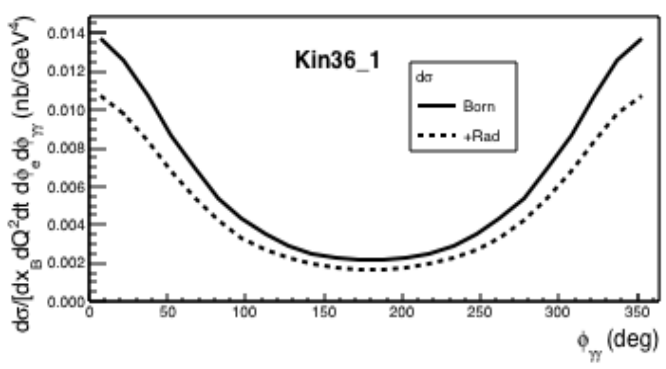
- Radiative tail for emission of finite energy: Included in simulation
- Virtual Photons (Vertex, vacuum polarization)
  - Calculated with D. Lhuillier *et al.* code
    - M. Vanderhaeghen, J. M. Friedrich, D. Lhuillier, D. Marchand, L. Van Hoorebeke, and J. Van de Wiele, Phys. Rev. C **62** (2000) 025501
    - My version only has Nucleon-pole term (”Born”) in VCS amplitude (<<BH) from P.A.M. Guichon.
- Radiation of photons below the resolution scale
  - Correction factor $exp\left[-\delta^0_{R,El}\right]$

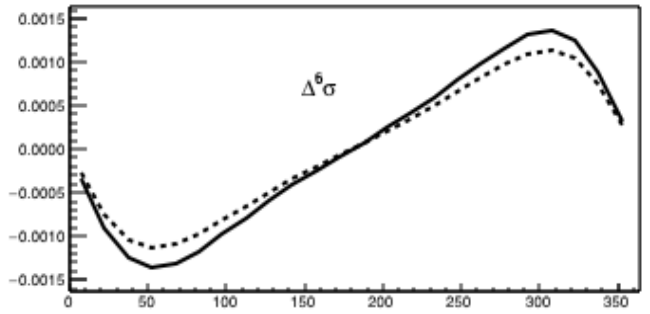
$$\delta^{(0)}_{R,\,\mathrm{El}} = \frac{\alpha}{\pi}\left[\frac{1}{2}\ln^2\left(\frac{Q^2}{m_e^2}\right) - \frac{1}{2}\ln^2\left(\frac{E'_e}{E_e}\right) - \frac{\pi^2}{3} + \mathrm{Sp}\left(\cos^2\frac{\theta_e}{2}\right)\right]$$

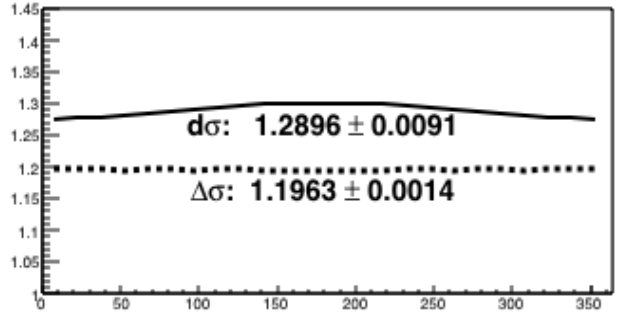
$X_{BJ} = 0.36$

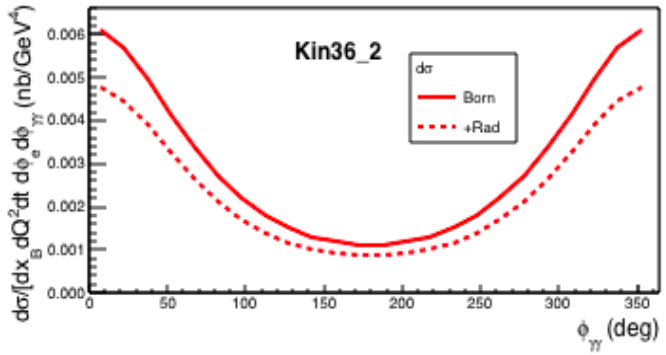
- Virtual only
  $-t = 0.25$ **GeV**^{2}

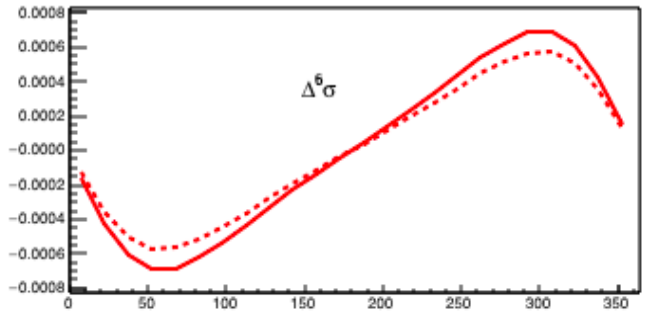
$\text{Exp}(-\delta_R^{(0)}) = 0.737$
Net RadCorr ~ 1.29*0.737 = 0.951

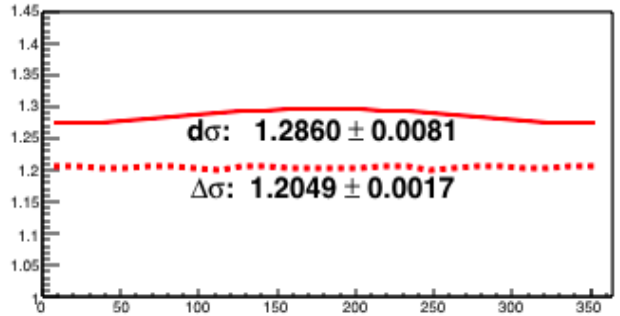


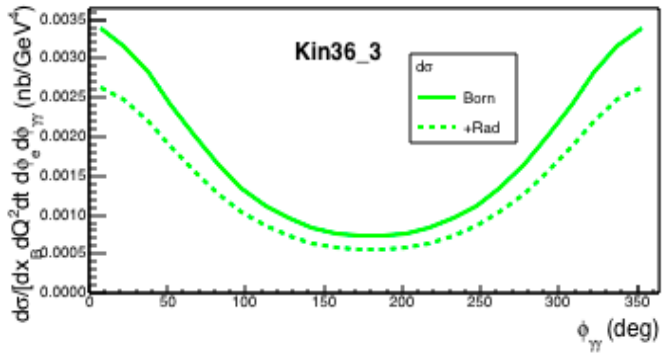


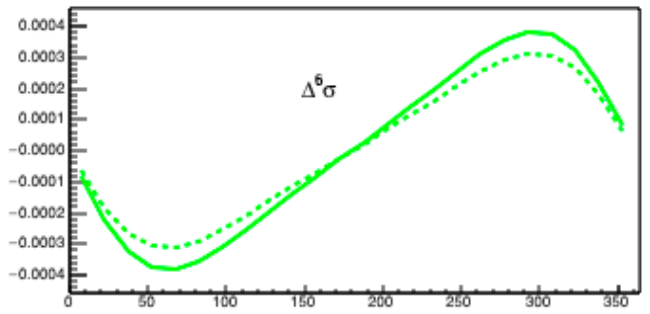


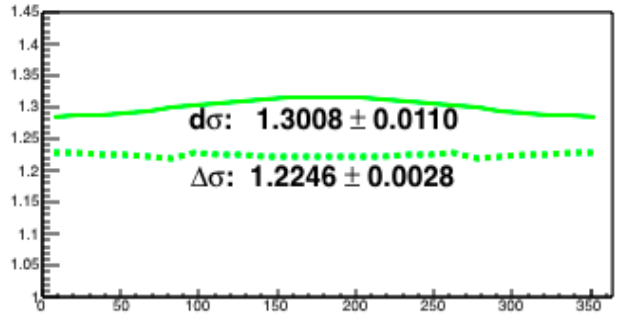








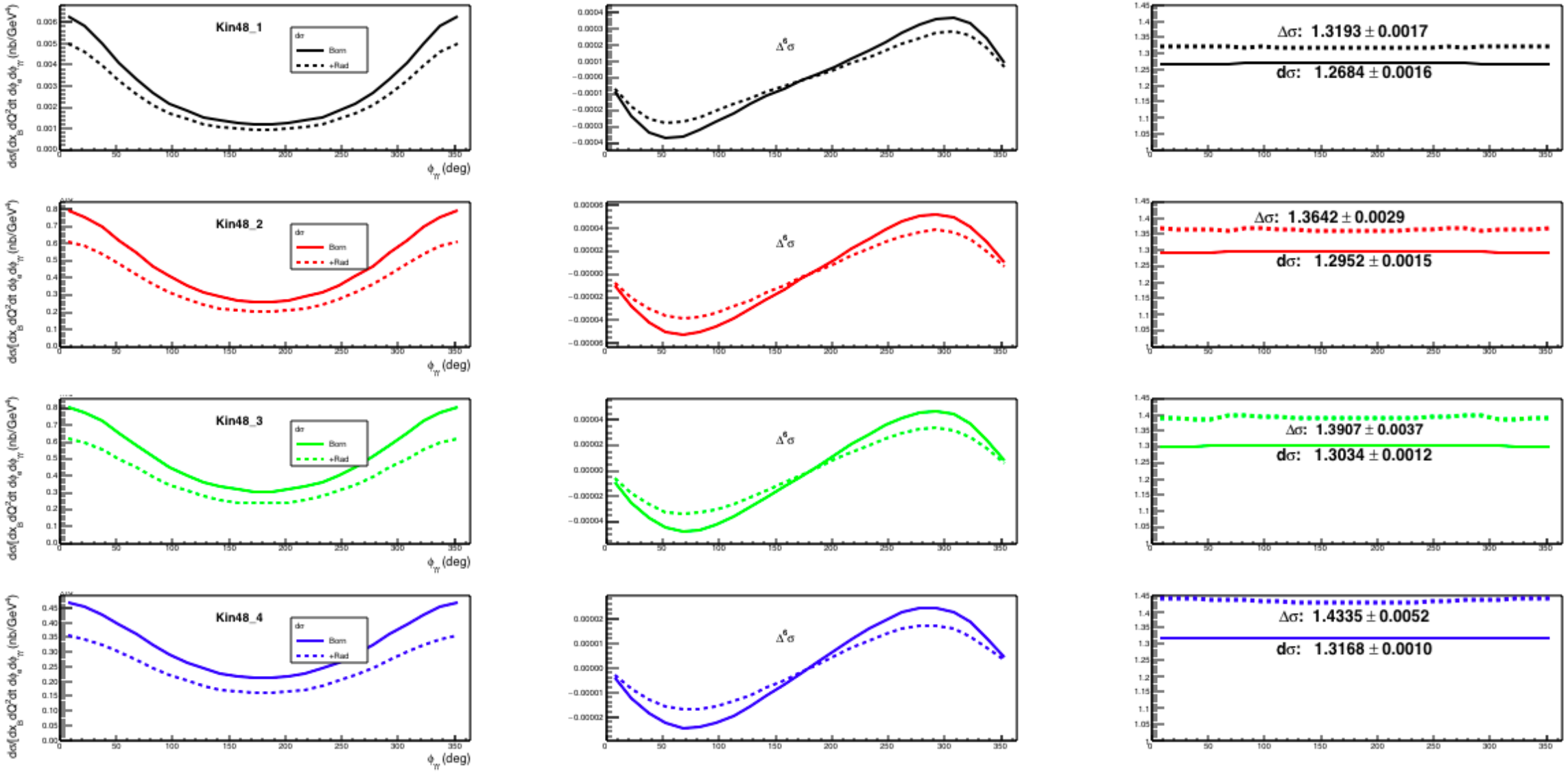




$X_{BJ} = 0.48$

- Virtual only
  -t = 0.40 GeV^2

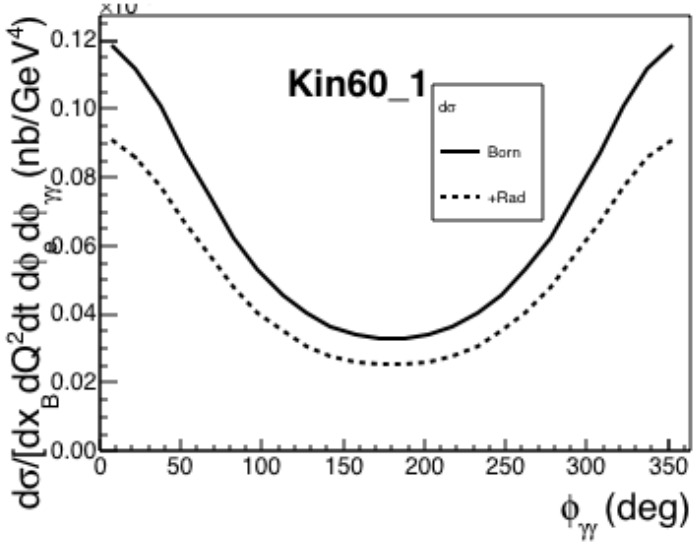
$\text{Exp}(-\delta_R^{(0)}) = 0.728$
Net RadCorr ~ 1.30*0.728 = 0.947

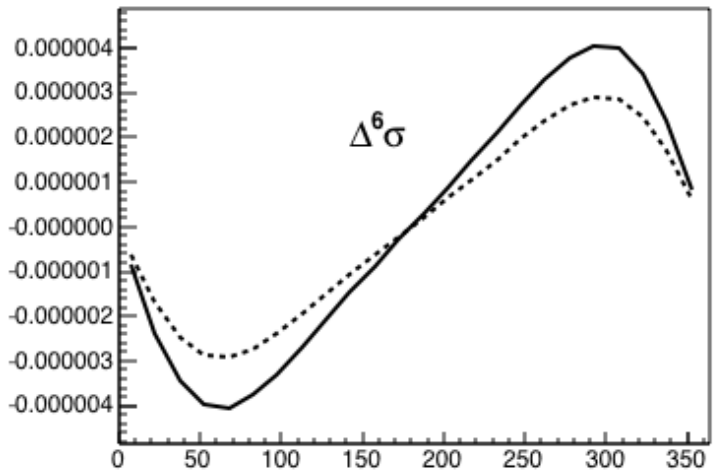


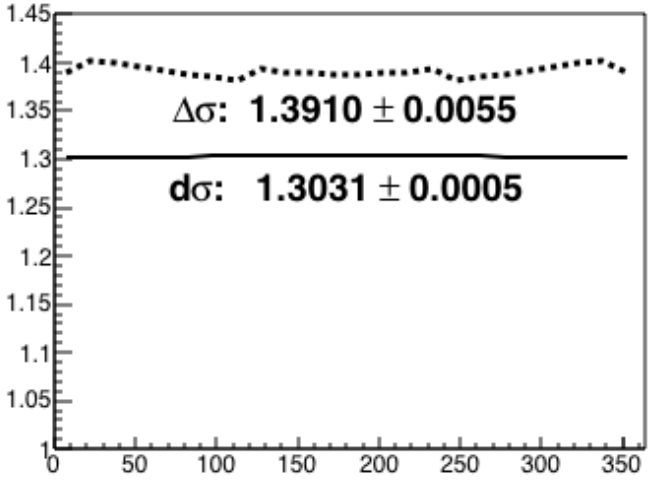
$X_{BJ} = 0.60$

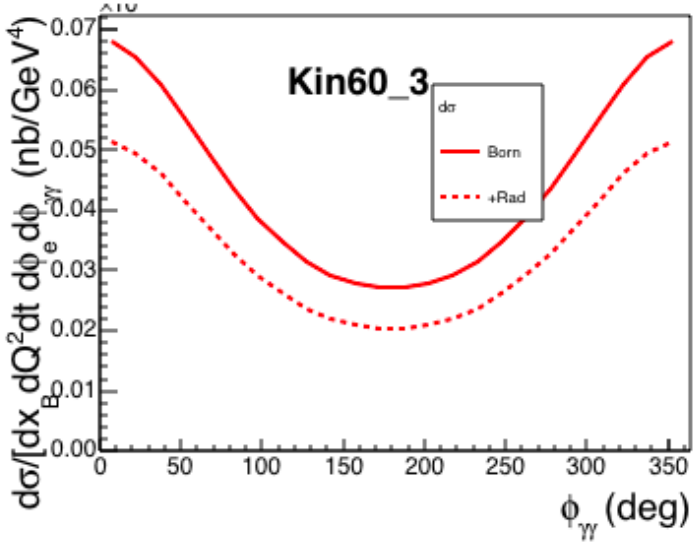
- Virtual only
  $-t = 1.0$ GeV^2

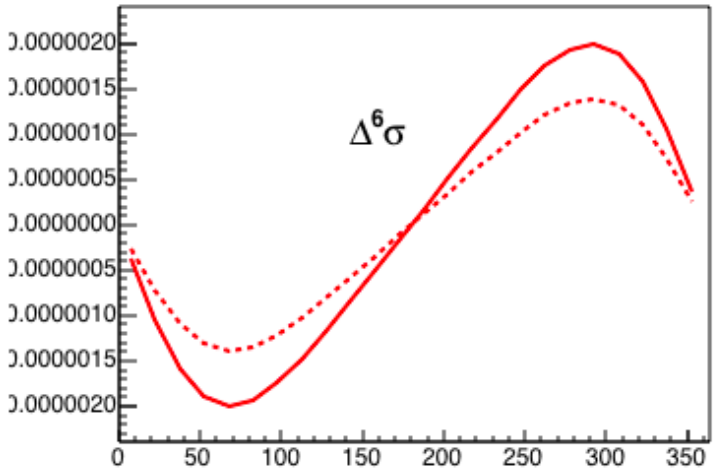
$\mathrm{Exp}(-\delta_R^{(0)}) = 0.722$
Net RadCorr ~ 1.31*0.722 = 0.945

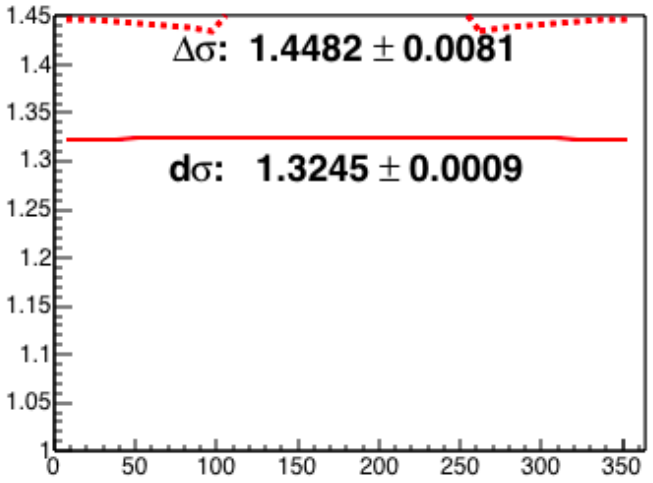












UNRESOLVED ISSUES

- Compare with analytic results
- Corrections are different for BH and VCS amplitudes (but independent of form of VCS)
- Corrections are ambiguous when $|BH|^2$, [DVCS*BH], and $|DVCS|^2$ all appear.
  - In these calculations, $d\sigma$ = pure $|BH|^2$, $\Delta\sigma$ = pure [DVCS*BH]