

MCSANC DY NC generator: status

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MCSANC DY NC generator:

- has the same structure and FORTRAN modules as in the MCSANC integrator
- is a Monte Carlo event generator based on “Foam” algorithm
- have NLO EW corrections only for DY NC (no PI, no HO at the moment)
- produce events in LHE and Les Houches format, can be used by other generators

MCSANC integrator vs. MCSANC DY NC generator

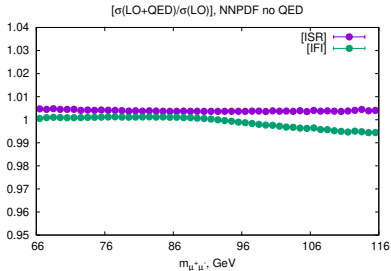
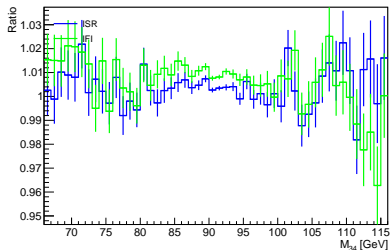
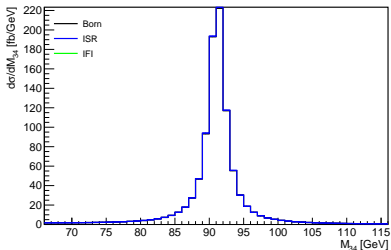
Integrator	Generator
DY NC, DY CC, HZ, HW, tb (s-, t-channels)	Only DY NC process
Photon-induced and HO processes for DY	No (in progress)
Multi-processor mode	One-processor mode
Prepared histogramms only	Events in LHE and Les Houches format
Histogramms can be used only by K-factor algorithm	Events can be used by other programs

All results for generator are for 10M events

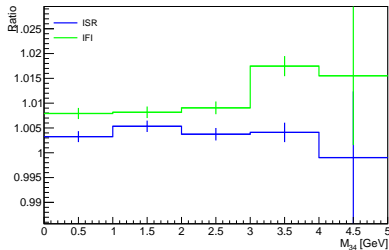
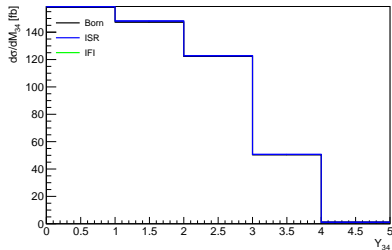
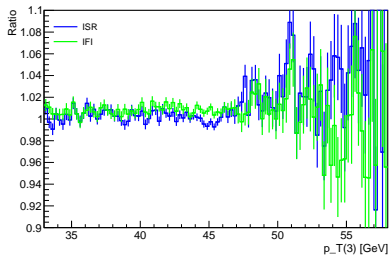
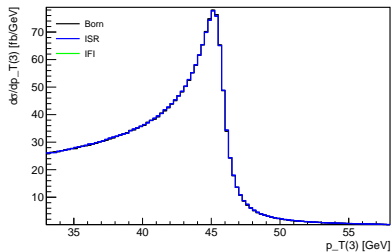
SETUP:

- LO QCD – no QCD corrections
- Initial-State-Radiation (ISR) and Initial-Final-Interference (IFI) QED effects – no WEAK and Final-State-Radiation (FSR) effects
- NNPDF31_nlo_as_0118_luxqed (lux QED) PDF-function
- G_μ EW-scheme: Born $\sim \alpha^2(G_\mu)$, Virt, Subt (DIS), Soft-, Hard-Brem $\sim \alpha_0\alpha^2(G_\mu)$
($\alpha_0=1/137.0360, \alpha(G_\mu)=1/132.2332$)
- Fixed-width scheme: $\text{prop}(s, M_Z) = 1/(s - [M_Z^2 - iM_Z w_Z])$
- physical parameters are from the hep-ph:1606.02330
- cuts options:
 - **TV - the total volume:** $66 \text{ GeV} < m_{\mu+\mu^-} < 116 \text{ GeV}$
- observables:
 - $\sigma(\text{LO})$ – LO cross-section (pb),
 - $\delta(\text{QED}) = \sigma(\text{QED})/\sigma(\text{LO})$ – relative contribution;
 - $A_{\text{FB}}(\text{LO})$ – asymmetry,
 - $\Delta A[\text{QED}] = [A_{\text{FB}}(\text{LO+QED}) - A_{\text{FB}}(\text{LO})]$ – difference of asymmetries,
where
 - $A_{\text{FB}}(\text{LO+QED}) = (\text{F-B})/(\text{F+B}),$

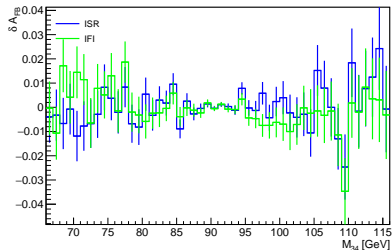
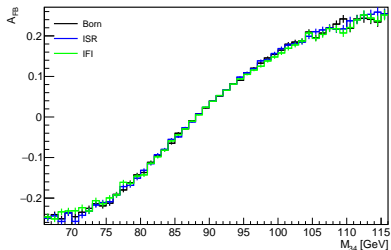
The cross-section $\sigma(\text{QED})$ and ratio $R = \sigma(\text{QED})/\sigma(\text{LO})$ distribution on $m_{\mu^+\mu^-}$



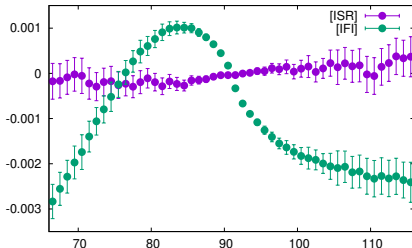
The cross-section $\sigma(\text{QED})$ and ratio $R = \sigma(\text{QED})/\sigma(\text{LO})$



The difference $[A_{\text{FB}}(\text{LO}+\text{QED})-A_{\text{FB}}(\text{LO})]$ distribution on $m_{\mu^+\mu^-}$



$[A_{\text{FB}}(\text{LO}+\text{QED})-A_{\text{FB}}(\text{LO})]$, NNPDF lux QED, TV



The $A_{\text{FB}}(\text{LO}+\text{QED})$ and difference $[A_{\text{FB}}(\text{LO}+\text{QED})-A_{\text{FB}}(\text{LO})]$ distribution on $y_{\mu+\mu^-}$

