

MC studies for High p_T analysis

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- MC studies were performed in order to provide starting point for systematic studies.
- Impact of Parton Shower was tested for MC with standard tuning of fragmentation in Lepto - HpT sample.
- Impact of Radiative Corrections was tested for Inclusive and Seminclusive samples.

Parton Shower exercise

Data:

- 04W22
- Standard HpT selection:
 - $p_T > 0.7$
 - No x_{bj} cut
- No Σp_T^2 cut

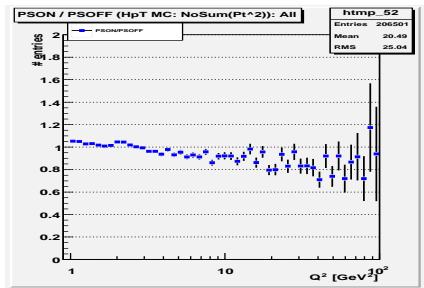
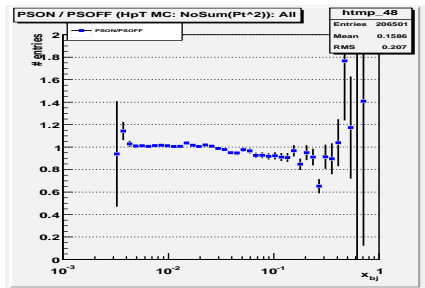
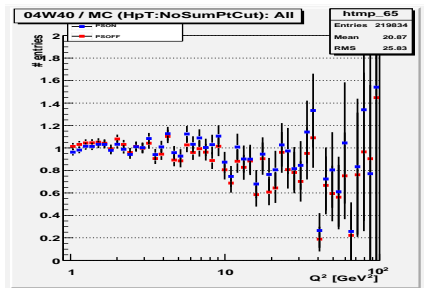
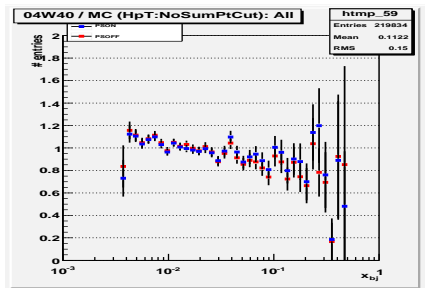
MC:

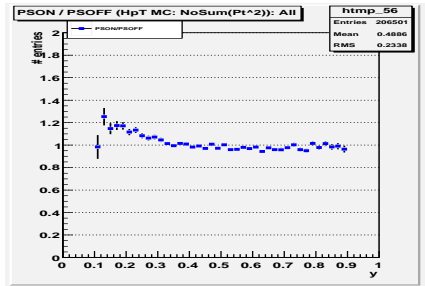
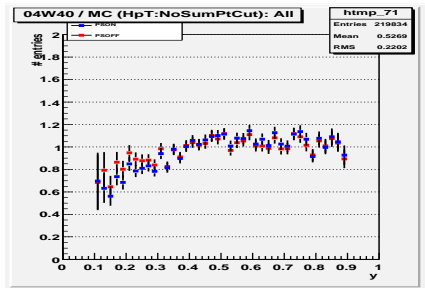
- Standard tuning of fragmentation in Lepto
- Hodoscope efficiencies: 04W40
- Comparison of **PSON** and **PSOFF**

x_{bj} Q^2

RD / MC

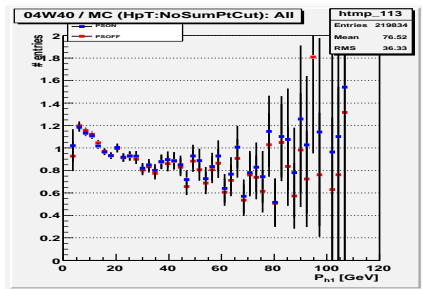
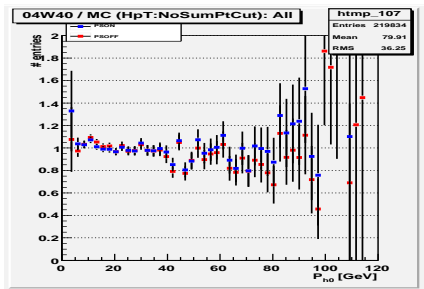
PSON / PSOFF



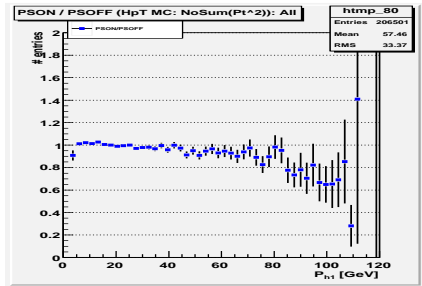
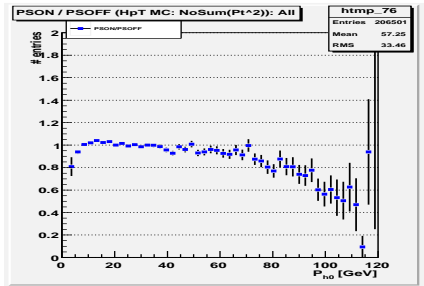


p_0 p_1

RD / MC

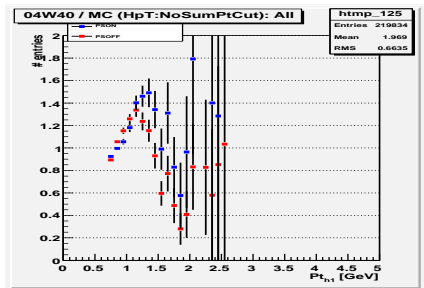
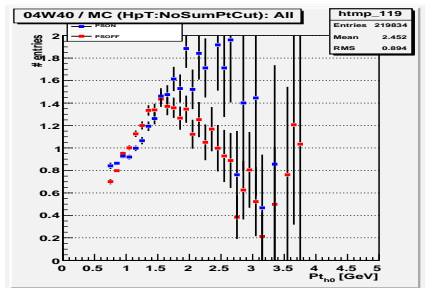


PSON / PSOFF

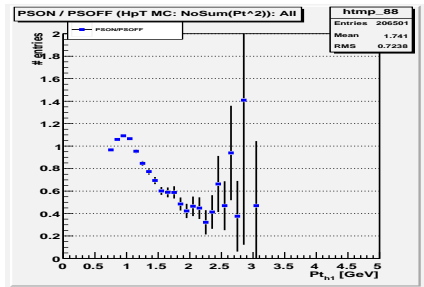
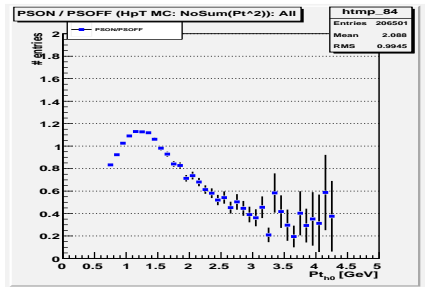


p_{T0} p_{T1}

RD / MC



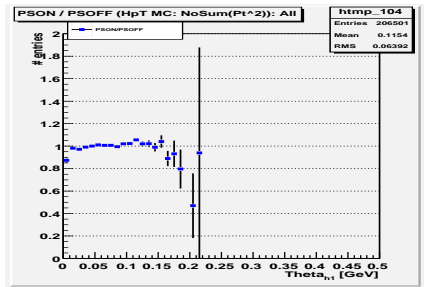
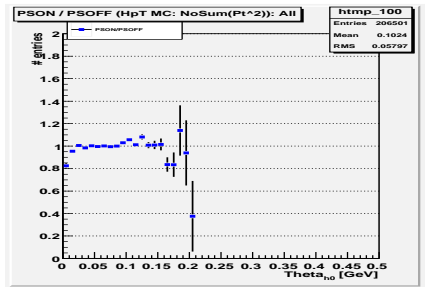
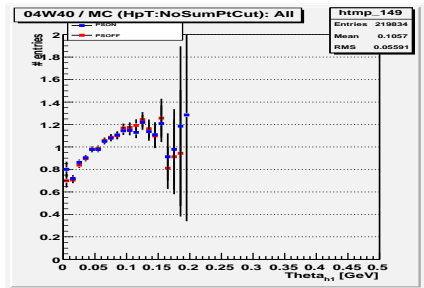
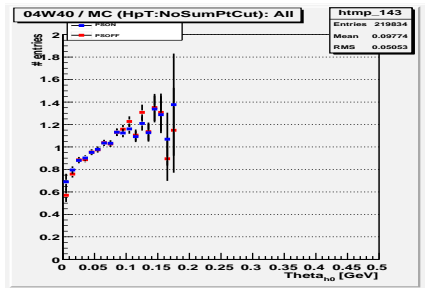
PSON / PSOFF



θ_0 θ_1

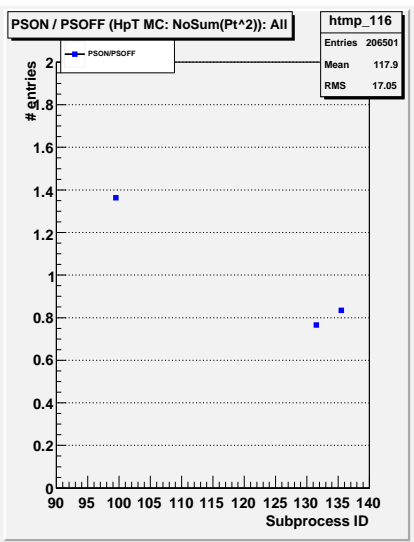
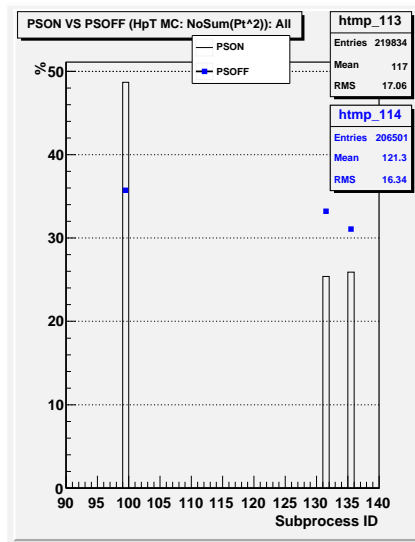
RD / MC

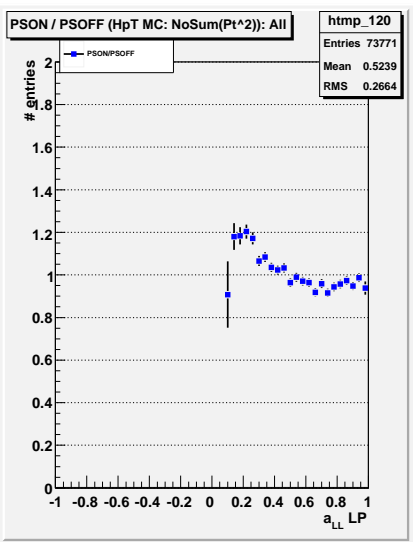
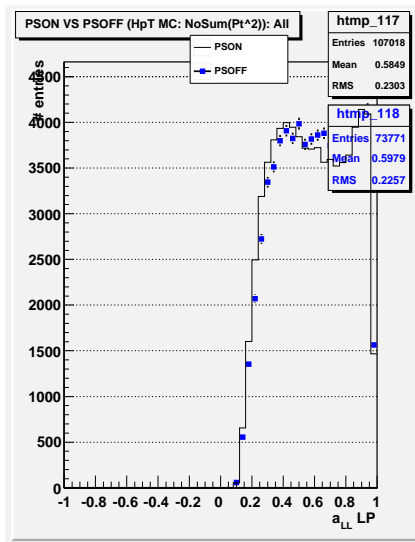
PSON / PSOFF



PS_ON

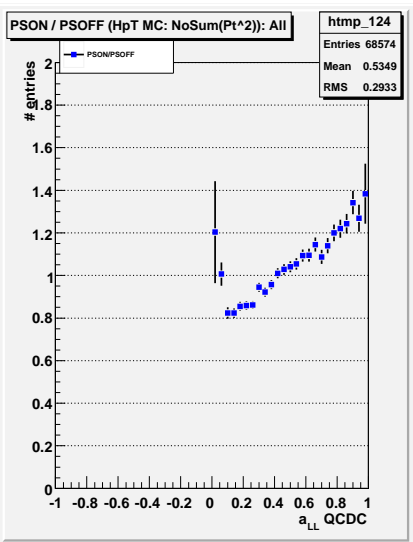
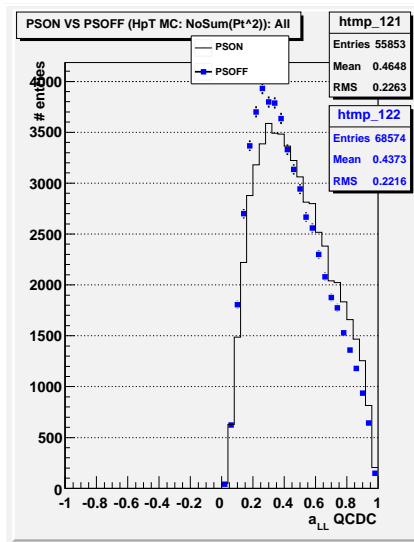
PS_OFF

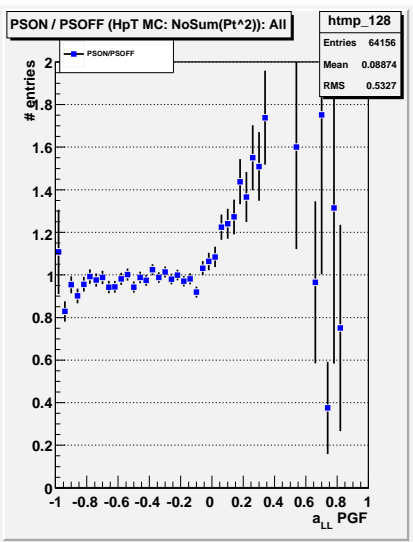
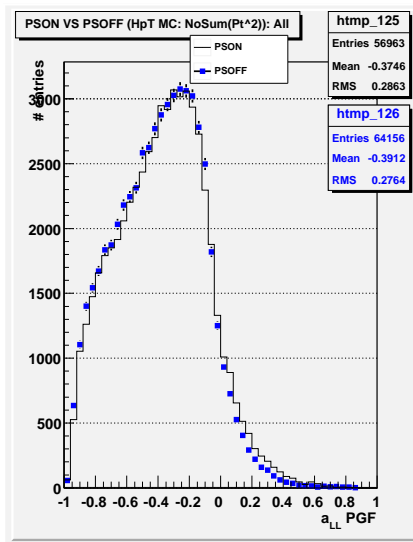


PS_ON: $\langle a_{LL}^{LP} \rangle = 0.585$ PS_OFF: $\langle a_{LL}^{LP} \rangle = 0.598$ 

PS_ON: $\langle a_{LL}^{QCDC} \rangle = 0.465$

PS_OFF: $\langle a_{LL}^{QCDC} \rangle = 0.437$



PS_ON: $\langle a_{LL}^{PGF} \rangle = -0.375$ PS_OFF: $\langle a_{LL}^{PGF} \rangle = -0.391$ 

Radiative Corrections exercise

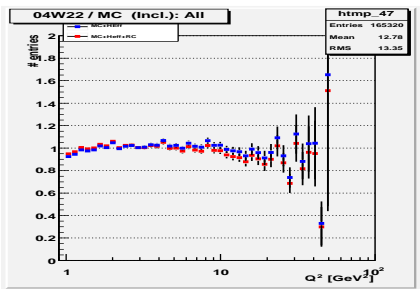
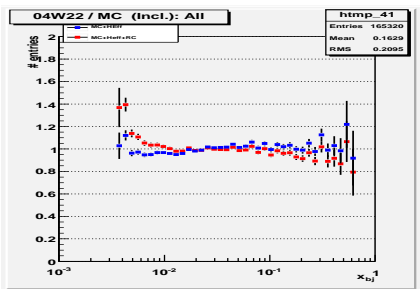
Data:

- 04W22
- At least one inclusive trigger fired (OT, incMT, J/Psi).
- μ' found in PV

MC

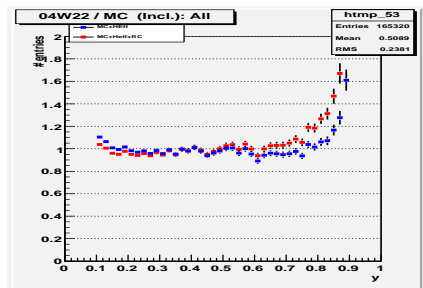
- Standard tuning of fragmentation in Lepto
- PS ON
- Hodoscope efficiencies: 04W40
- Comparison of stdMC and MC weighted with inclusive RC tables

x_{bj} , Q^2 , y



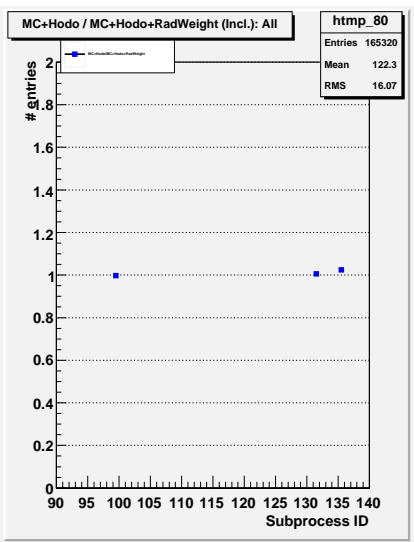
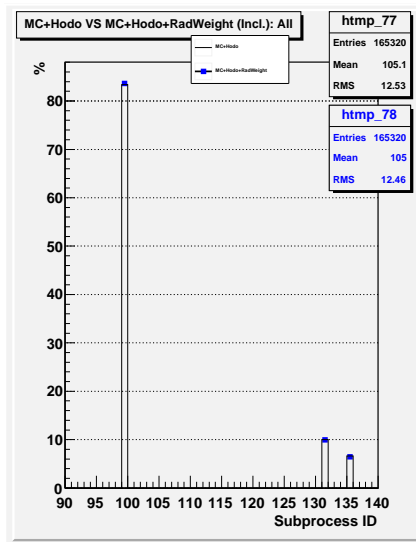
RD / MC No RC

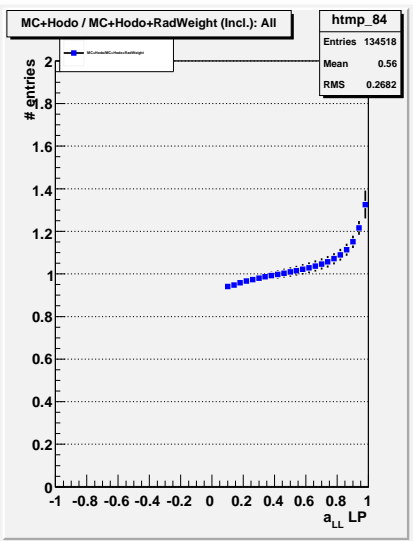
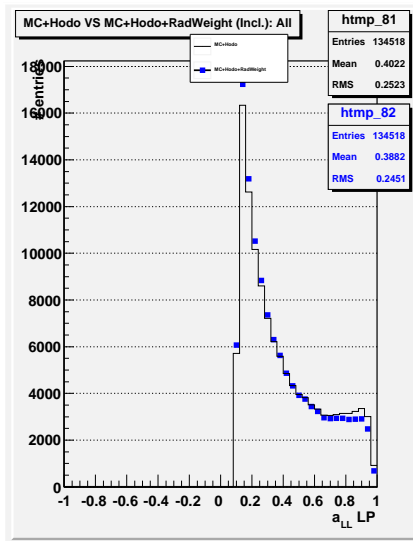
RD / MC weighted with inclusive RC tables

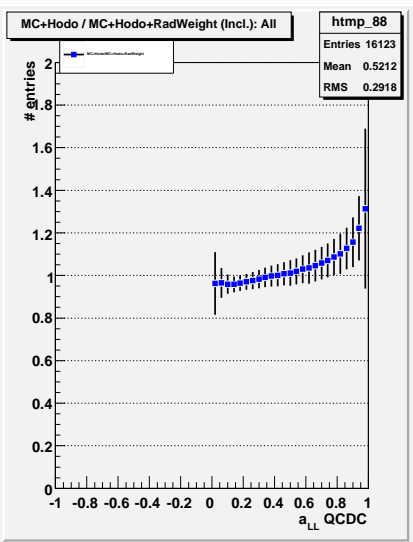
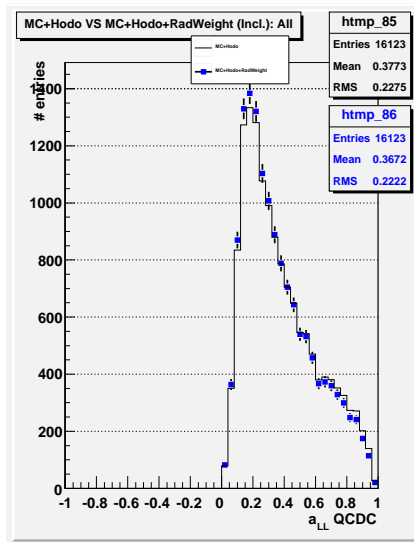


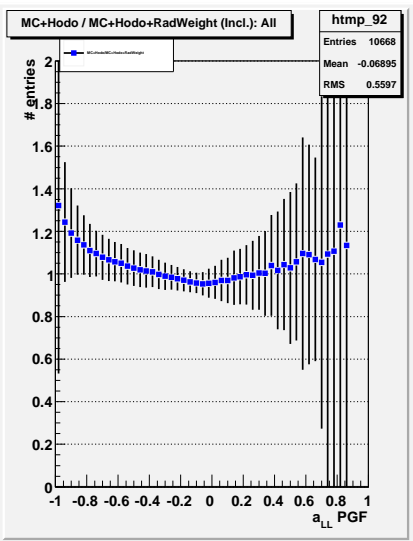
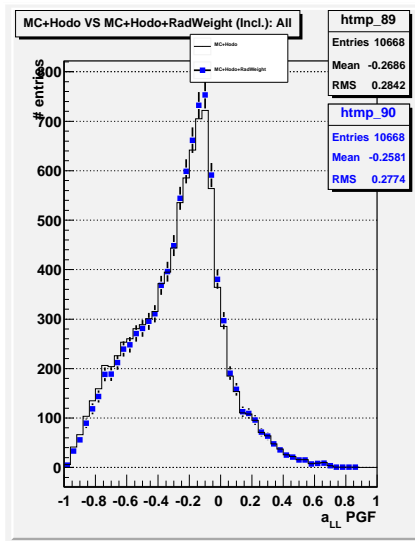
RC_ON

RC_OFF



RC_ON: $\langle a_{LL}^{LP} \rangle = 0.388$ RC_OFF: $\langle a_{LL}^{LP} \rangle = 0.402$ 

RC_ON: $\langle a_{LL}^{QCDC} \rangle = 0.367$ RC_OFF: $\langle a_{LL}^{QCDC} \rangle = 0.377$ 

RC_ON: $\langle a_{LL}^{PGF} \rangle = -0.258$ RC_OFF: $\langle a_{LL}^{PGF} \rangle = -0.269$ 

Radiative Corrections exercise part2

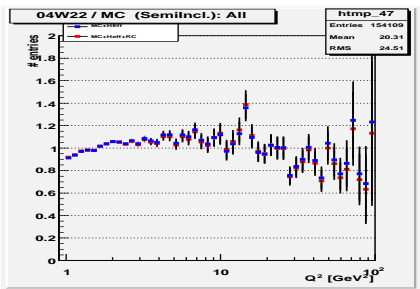
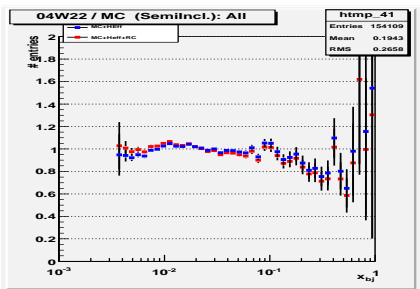
Data:

- 04W22
- μ' found in PV
- At least one semiinclusive trigger fired (IT, LT, MT, CT).
 - At least on hadron in PV

MC

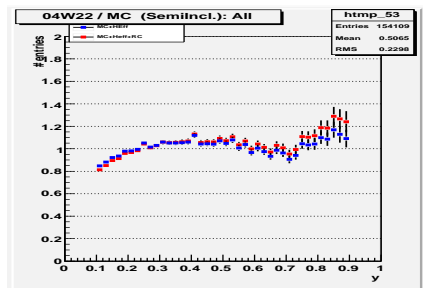
- Standard tuning of fragmentation in Lepto
- PS ON
- Hodoscope efficiencies: 04W40
- Comparison of stdMC and MC weighted with “hadron” RC tables

x_{bj} , Q^2 , y



RD / MC No RC

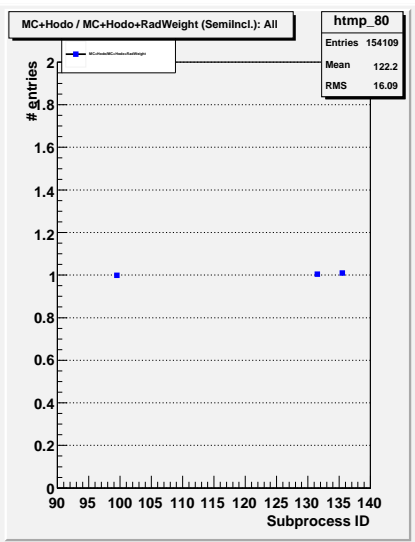
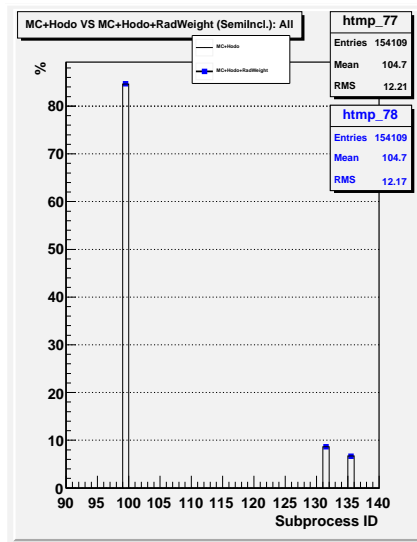
RD / MC weighted with "hadron" RC tables

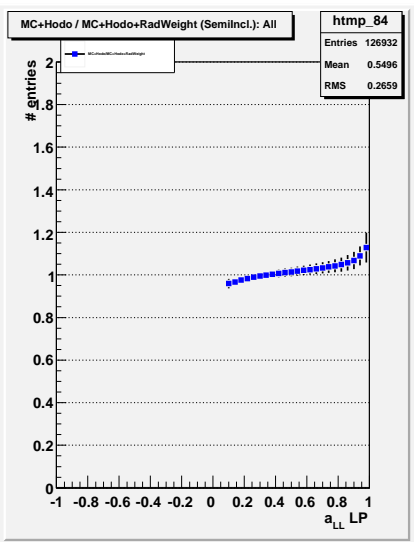
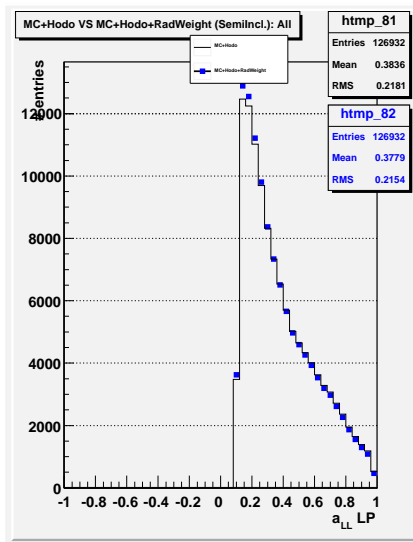


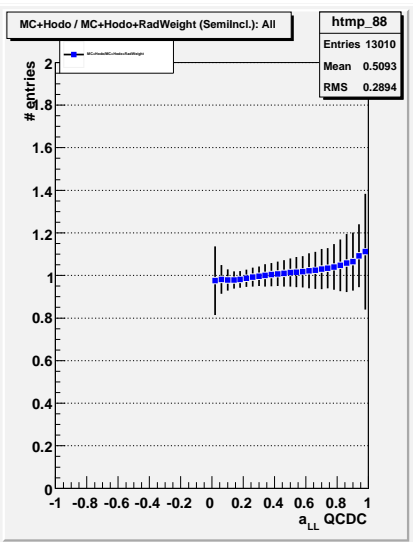
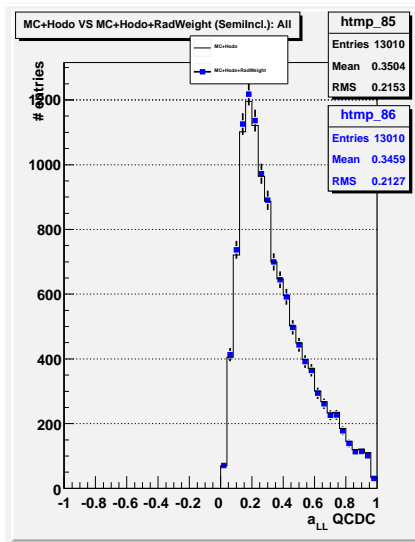
Process fraction

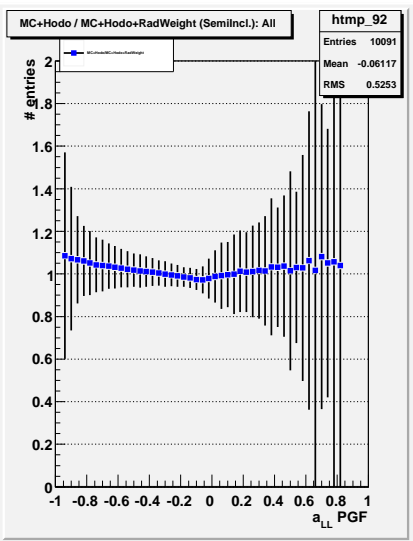
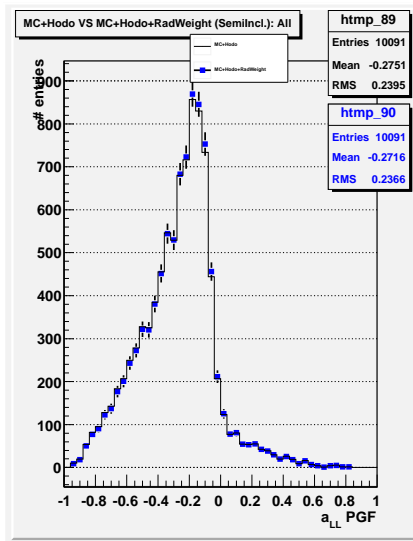
RC_ON

RC_OFF



RC_ON: $\langle a_{LL}^{LP} \rangle = 0.378$ RC_OFF: $\langle a_{LL}^{LP} \rangle = 0.384$ 

RC_ON: $\langle a_{LL}^{QCDC} \rangle = 0.346$ RC_OFF: $\langle a_{LL}^{QCDC} \rangle = 0.350$ 

RC_ON: $\langle a_{LL}^{PGF} \rangle = -0.272$ RC_OFF: $\langle a_{LL}^{PGF} \rangle = -0.275$ 

Summary

Parton Shower:

- Two MC samples ~200k events each were prepared.
 - Std Lepto tuning of fragmentation.
 - PS ON and PS OFF.
 - ASCII files for NN are prepared.
- Impact of PS is rather large - should be included in systematic error

Radiative Corrections:

- RC tables were applied to Inclusive and SemiInclusive MC.
- Impact of weighting on interesting quantities from HpT analysis point of view:
(Subprocess fractions, a_{LL}^{LP} , a_{LL}^{QCDC} , a_{LL}^{PGF})
Is not dramatic.

Possible systematic studies:

- Calculate $\Delta G/G$ using HpT MC:
StdPS_ON, StdPS_OFF, SonjaTunePS_ON, SonjaTunePS_OFF
- Estimate effect of RC by calculating $\Delta G/G$ using “average” method with Inclusive MC input weighted and not weighted by RC tables.