Analysis Update: p_{T} spectra as a function of R_{T} for pp collisions at $\sqrt{s} = 5.02$ TeV¶

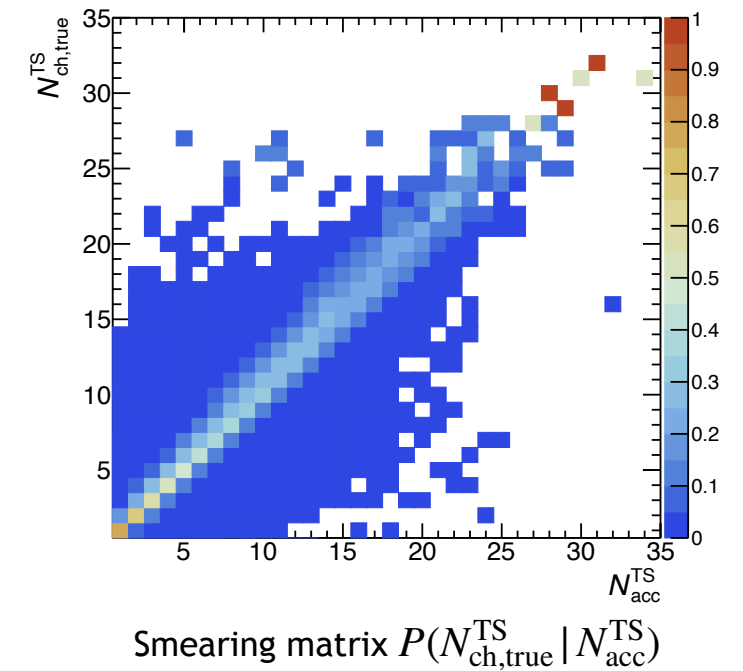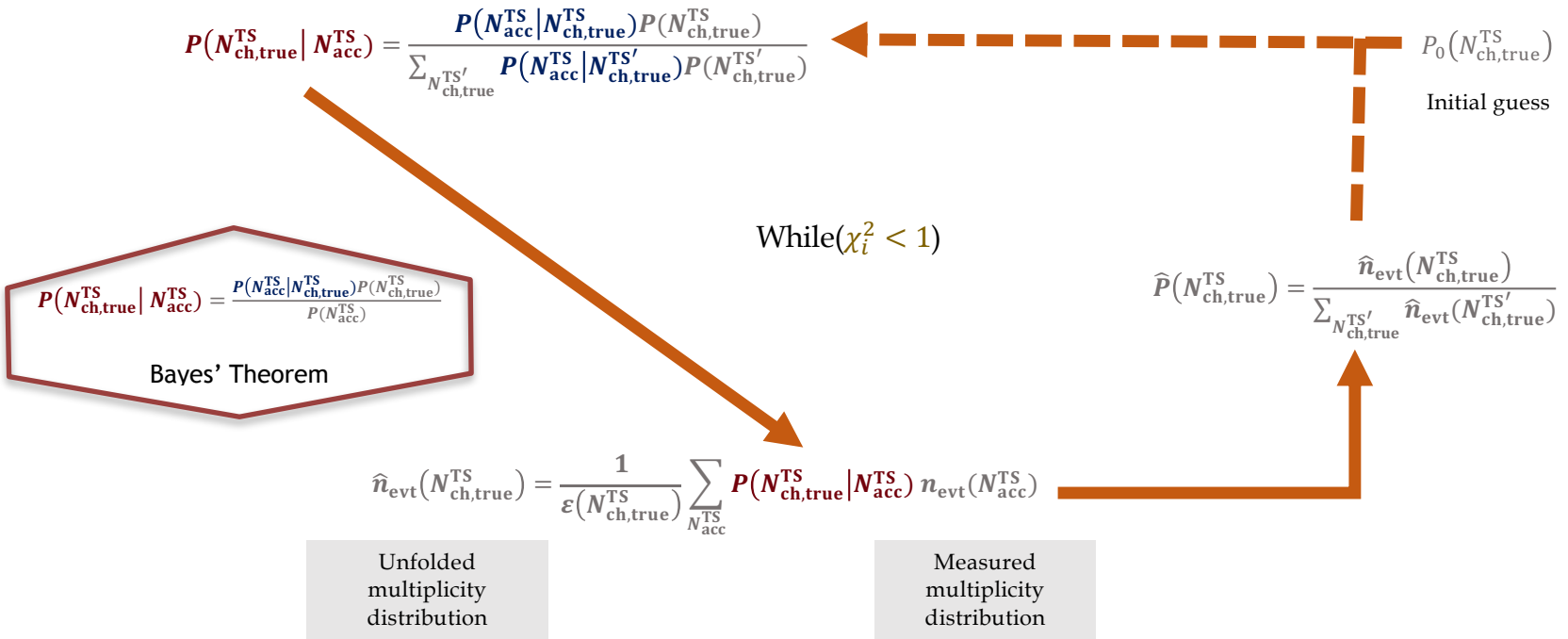**Tutor: Dr. Antonio Ortiz Velásquez**

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Tuesday, November 16th 2021

Purpose: To obtain a better estimate of the true distribution of the multiplicity of charged particles from the development of experimental distributions.

$N_{\text{ch,true}}^{\text{TS}}$: True multiplicity in the Transverse region.
$N_{\text{acc}}^{\text{TS}}$: Multiplicity distribution of measured events in the Transverse region.
$P(N_{\text{acc}}^{\text{TS}}|N_{\text{ch,true}}^{\text{TS}})$: Multiplicity response matrix.

$$P(N_{\text{ch,true}}^{\text{TS}}|N_{\text{acc}}^{\text{TS}}) = \frac{P(N_{\text{acc}}^{\text{TS}}|N_{\text{ch,true}}^{\text{TS}})P(N_{\text{ch,true}}^{\text{TS}})}{\sum_{N_{\text{ch,true}}^{\text{TS}'}}P(N_{\text{acc}}^{\text{TS}}|N_{\text{ch,true}}^{\text{TS}'})P(N_{\text{ch,true}}^{\text{TS}'})}$$

$P_0(N_{\text{ch,true}}^{\text{TS}})$

Initial guess

$$P(N_{\text{ch,true}}^{\text{TS}}|N_{\text{acc}}^{\text{TS}}) = \frac{P(N_{\text{acc}}^{\text{TS}}|N_{\text{ch,true}}^{\text{TS}})P(N_{\text{ch,true}}^{\text{TS}})}{P(N_{\text{acc}}^{\text{TS}})}$$

Bayes' Theorem

While($\chi_i^2 < 1$)

$$\widehat{P}(N_{\text{ch,true}}^{\text{TS}}) = \frac{\widehat{n}_{\text{evt}}(N_{\text{ch,true}}^{\text{TS}})}{\sum_{N_{\text{ch,true}}^{\text{TS}'}}\widehat{n}_{\text{evt}}(N_{\text{ch,true}}^{\text{TS}})}$$

$$\widehat{n}_{\text{evt}}(N_{\text{ch,true}}^{\text{TS}}) = \frac{1}{\varepsilon(N_{\text{ch,true}}^{\text{TS}})}\sum_{N_{\text{acc}}^{\text{TS}}}P(N_{\text{ch,true}}^{\text{TS}}|N_{\text{acc}}^{\text{TS}})\,n_{\text{evt}}(N_{\text{acc}}^{\text{TS}})$$

Unfolded multiplicity distribution

Measured multiplicity distribution

Smearing matrix $P(N_{\text{ch,true}}^{\text{TS}}|N_{\text{acc}}^{\text{TS}})$

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ALICE

NEW

First: Apply the tracking efficiency and secondary particle contamination

Second:

$$\left(\begin{array}{c} \text{Multiplicity response} \\ \text{matrix, } P(N^{\mathrm{TS}}_{\mathrm{acc}} | N^{\mathrm{TS}}_{\mathrm{ch,true}}) \end{array} \right) \times \left(\begin{array}{c} \text{Weight of the number} \\ \text{of measured particles} \end{array} \right)$$

Steps that were followed

☑Identification of histograms used with MC and data.

MC

```
TH1D * hNchTSGen;
TH1D * hNchTSGenTest;
TH1D * hNchGen;
TH1D * hNchGenTest;
TH1D * hNchTSRec;
TH1D * hNchTSRecTest;
TH2D * hNchResponse;
TH1D * hNchRecTest;
TH1D * hPtInPrim;
TH1D * hPtInPrim_pion;
TH1D * hPtInPrim_kaon;
TH1D * hPtInPrim_proton;
TH1D * hPtInPrim_sigmap;
TH1D * hPtInPrim_sigmam;
TH1D * hPtInPrim_omega;
TH1D * hPtInPrim_xi;
TH1D * hPtInPrim_rest;
TH1D * hPtOut;
TH1D * hPtOutPrim;
```

```
TH1D * hPtOutPrim_pion;
TH1D * hPtOutPrim_kaon;
TH1D * hPtOutPrim_proton;
TH1D * hPtOutPrim_sigmap;
TH1D * hPtOutPrim_sigmam;
TH1D * hPtOutPrim_omega;
TH1D * hPtOutPrim_xi;
TH1D * hPtOutPrim_rest;
TH1D * hPtOutSec;
TH1D * hCounter;
TH2D * hPtVsUEGenTest[3];
TH2D * hPtVsUERecTest[3];
TH2D * hPtVsNchGenTest[3];
TH2D * hPtVsNchRecTest[3];
TH1D * hPhiGen[3];
TH1D * hPhiRec[3];
TH2F * hptvsdcaPrim;
TH2F * hptvsdcaDecs;
TH2F * hptvsdcaMatl;
TH2F * hptvsdcaAll;
```
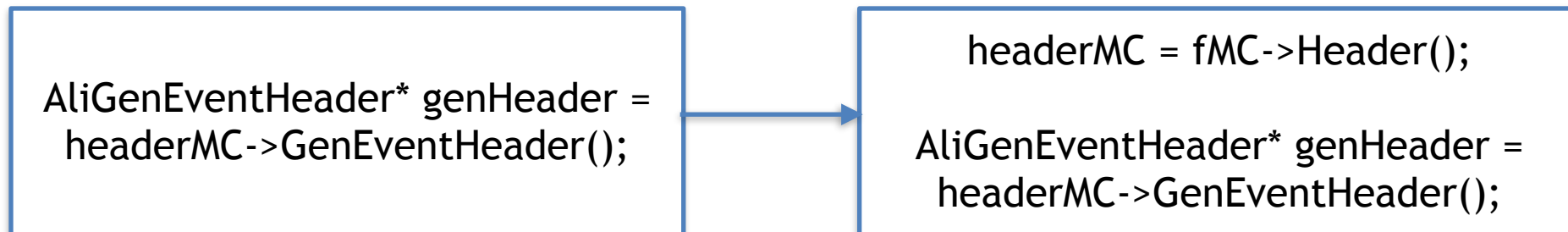
Data

```
TH1D * hNchData;
TH1D * hNchTSData;
TH2D * hPtVsUEData[3];
TH2D * hPtVsNchData[3];
TH2D * hPTVsDCAData;
```

General

```
TH1F * hPhiTotal;
TH1F * hPhiStandard;
TH1F * hPhiHybrid1;
```

Steps that were followed

☑Implementation of a parameter to run with data (fUseData).
☑Correction associated with headerMC:

AliGenEventHeader* genHeader = headerMC->GenEventHeader();

headerMC = fMC->Header();

AliGenEventHeader* genHeader = headerMC->GenEventHeader();

☑Implementation of the parameter (fUseData) in the function UserExec.
☑Run on local mode to verify each part of the analysis and also to verify the memory consumption.

☐ Run on GRID to observe if the rate of jobs accepted are more than the last one.

Thank you