

Status Weekly Ξ^0_c analysis meeting, Sep. 30, 2021, CKim

- **Crosscheck to Jinjoo's result**

- **Updates in last two weeks**

- a. *AliAnalysisTask*: pileup rejection updated by new info based on SPD contributors ([link](#))
 - pushed the code to Xic0 Git repository: I believe Jinjoo tested this code on her end
 - Jinjoo received another method (different function)
- b. Year by Year weighting factor calculation to deal with 2016-2018 dataset
 - b-1. Each year's V0 xSec is slightly different, thus proper weighting required
 - b-2. 1st method: get eXi pair's run number distribution and use it to calculate weighting factor (old and obsolete, but currently sitting on Git repo)
 - b-3. 2nd method: get weighting factor from norm. factor from ANC object in each year's data (e.g., *AnalysisResults_2016.root*->*AliNormalizationCounter*->*GetNeventsForNorm()*)

- **Status and Short term plan**

- a. Waiting for Jinjoo's train run finishes
- b. Once the new train run available, resume xCheck with Jinjoo's results, then report to D2H
- c. Items plan to report in next D2H:
 - c-1. xCheck to Jinjoo's results
 - c-2. Sanghoon's study on low pT: unstable behavior due to BG dominance, thus discard the point
 - c-2. INEL>0 effect on xSec (decomposed by trig + multiplicity) + Xic0/Lc vs. pT

V0 xSec function Hard coded, but wrapped in function

```
//-----
double GetV0xSec(int Year, const char* Type = "pp")
{
    double xSec = -999;

    // https://twiki.cern.ch/twiki/bin/viewauth/ALICE/EventNormalization#proton_proton_at_sqrt_s_13_T_AN1
    // Last checked Sep. 27, 2021

    // V0 xSec @ pp 13 TeV
    // pp 2016: 58.44 (mb) +- 1.0/1.6/1.9 (% , correlated, uncorrelated, and total)
    // pp 2017: 58.10      +- 1.2/2.4/2.7
    // pp 2018: 57.52      +- 1.0/1.8/2.1

    // V0 @ p-Pb 5.02 TeV (2013) (* no vdM in 2016 - use 2013 value)
    // p-Pb: 2.09 (b) +- 3.7 (%)
    // Pb-p: 2.12      +- 3.4

    if (Year==2016 && !strcmp(Type, "pp")==true) xSec = 58.44;
    if (Year==2017 && !strcmp(Type, "pp")==true) xSec = 58.10;
    if (Year==2018 && !strcmp(Type, "pp")==true) xSec = 57.52;

    if (Year==2016 && !strcmp(Type, "pPb")==true) xSec = 2.09;
    if (Year==2016 && !strcmp(Type, "Pbp")==true) xSec = 2.12;

    return xSec;
} //GetV0xSec
```

```
//Get normalization factor and year weighted V0xSec
const double NormF = GetNormFac("AnalysisResults_data.root", Form("ANC_%s", Suffix), true);
const double Frac2016 = GetNormFac("AnalysisResults_data_2016.root", Form("ANC_%s", Suffix))/NormF;
const double Frac2017 = GetNormFac("AnalysisResults_data_2017.root", Form("ANC_%s", Suffix))/NormF;
const double Frac2018 = GetNormFac("AnalysisResults_data_2018.root", Form("ANC_%s", Suffix))/NormF;

const double xSec2016 = GetV0xSec(2016, "pp");
const double xSec2017 = GetV0xSec(2017, "pp");
const double xSec2018 = GetV0xSec(2018, "pp");
const double xSecWgt = Frac2016*xSec2016 + Frac2017*xSec2017 + Frac2018*xSec2018;
const double V0xSec = xSecWgt * 1.E3; // multiplying 1.E3 - to match the scale? (from legacy code)
cout << Form("Frac: %4.3f (2016), %4.3f (2017), %4.3f (2018) / Weighted V0 xSec: %5.3f\n\n",
    Frac2016, Frac2017, Frac2018, xSecWgt);
```

Weighting factor Output by 2nd method (uses ANC object)

```

Terminal
/home/alidock/.sw/slc7_x86-64/RootUnfold/V02-00-01-alice5-46/include/TSVDUnfold_local.h:54:7: warning: 'class TSVDUnfold_local' has pointer data members [-Wffc++]
class TSVDUnfold_local : public TObject {
-----
/home/alidock/.sw/slc7_x86-64/RootUnfold/V02-00-01-alice5-46/include/TSVDUnfold_local.h:54:7: warning: but does not override 'operator=(const TSVDUnfold_local&)' [-Wffc++]
-----

Processing configuration MB_0to100...
Normalization factor from ANC_MB_0to100: 1.571409974 x 1.e9
Frac: 0.125 (2016), 0.400 (2017), 0.475 (2018) / Weighted V0 xSec: 57.867

FCN=16.9063 FROM MIGRAD STATUS=CONVERGED 12 CALLS 13 TOTAL
EDM=8.11979e-18 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER STEP FIRST
NO. NAME VALUE ERROR SIZE DERIVATIVE
1 p0 5.53997e-01 1.91378e-02 4.28547e-05 2.10570e-07
Add truth bin for -0.470143 fakes
-----

Processing configuration MB_0p1to30...
Normalization factor from ANC_MB_0p1to30: 0.438860618 x 1.e9
Frac: 0.126 (2016), 0.400 (2017), 0.474 (2018) / Weighted V0 xSec: 57.868

FCN=16.9063 FROM MIGRAD STATUS=CONVERGED 12 CALLS 13 TOTAL
EDM=8.11979e-18 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER STEP FIRST
NO. NAME VALUE ERROR SIZE DERIVATIVE
1 p0 5.53997e-01 1.91378e-02 4.28547e-05 2.10570e-07
Add truth bin for -0.470143 fakes
-----

Processing configuration MB_30to100...
Normalization factor from ANC_MB_30to100: 1.131101974 x 1.e9
Frac: 0.125 (2016), 0.399 (2017), 0.476 (2018) / Weighted V0 xSec: 57.867

FCN=16.9063 FROM MIGRAD STATUS=CONVERGED 12 CALLS 13 TOTAL
EDM=8.11979e-18 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER STEP FIRST
NO. NAME VALUE ERROR SIZE DERIVATIVE
1 p0 5.53997e-01 1.91378e-02 4.28547e-05 2.10570e-07
Add truth bin for -0.470143 fakes
-----

Processing configuration HMV0_0to0p1...
Normalization factor from ANC_HMV0_0to0p1: 0.429059067 x 1.e9
Frac: 0.199 (2016), 0.442 (2017), 0.359 (2018) / Weighted V0 xSec: 57.959

FCN=16.9063 FROM MIGRAD STATUS=CONVERGED 12 CALLS 13 TOTAL
EDM=8.11979e-18 STRATEGY= 1 ERROR MATRIX ACCURATE
EXT PARAMETER STEP FIRST
NO. NAME VALUE ERROR SIZE DERIVATIVE
1 p0 5.53997e-01 1.91378e-02 4.28547e-05 2.10570e-07
Add truth bin for -0.470143 fakes

root [1]

```

* May train output