HI Rivet status

31-10-2018
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Topics

Core – Centrality, Analysis parameters, reentrant finalize/analysis objects.

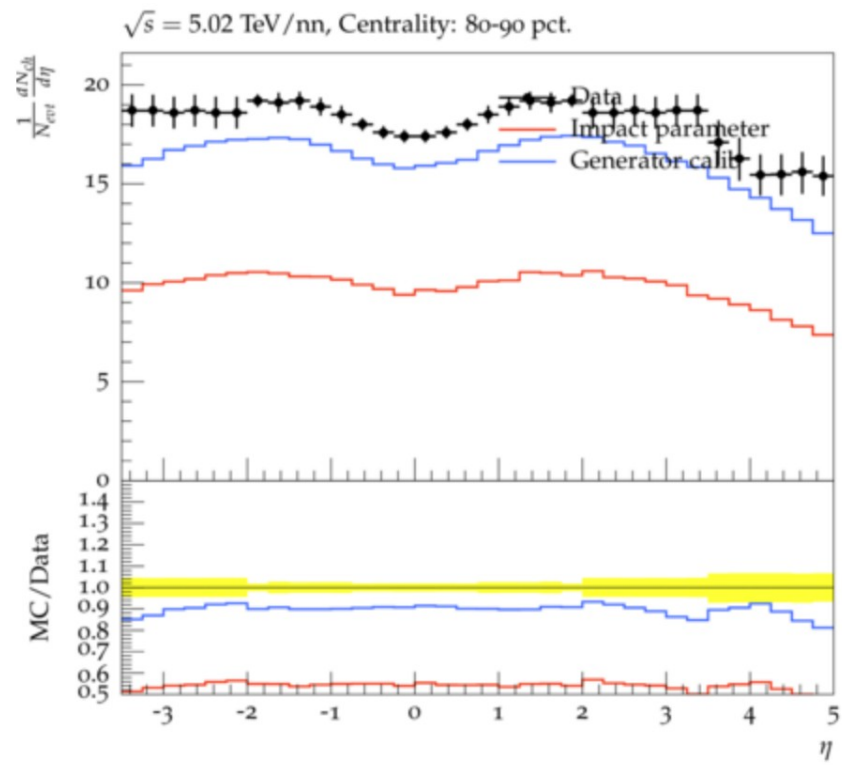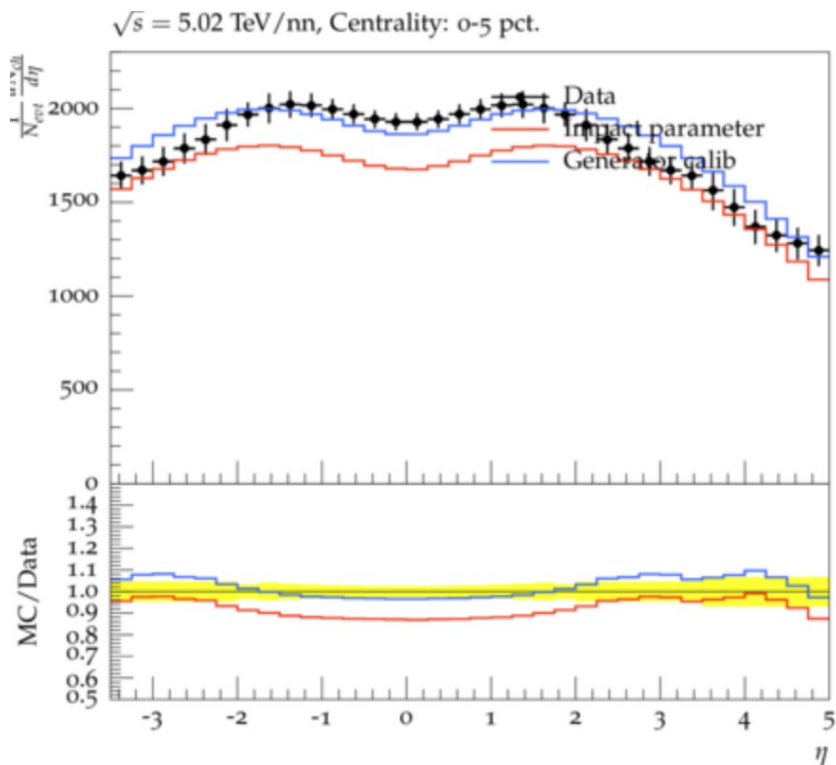Tools – Mixing, Flow, Primary particle definitions.

Analyses – PoP by CERN people, Copenhagen week analyses, other.

Road to release – Release deadline, merging branches.

Release note – Any physics points to be made?, integration with HepData.

Core: Centrality and analysis parameters.

Centrality – framework is in place, used in analyses; still needs validation.

Action points

→ **Specification via. Parameters: All is implemented, needs merging.**

→ **ALICE centrality measure – unfolding or use generator spectrum?**

→ **More sample analyses (see separately).**

→ **Strong physics point for release note? (somewhat repeating Angantyr paper).**

Core: Reentrant finalize

Framework in place, modulo histogram merging (Leif).

In separate branch.
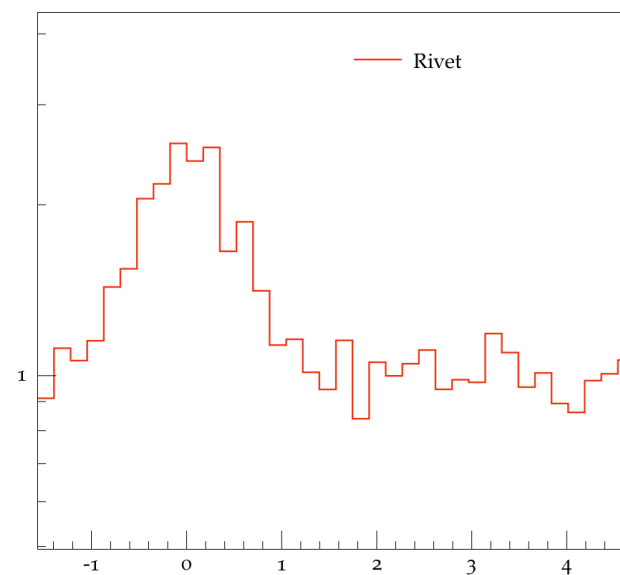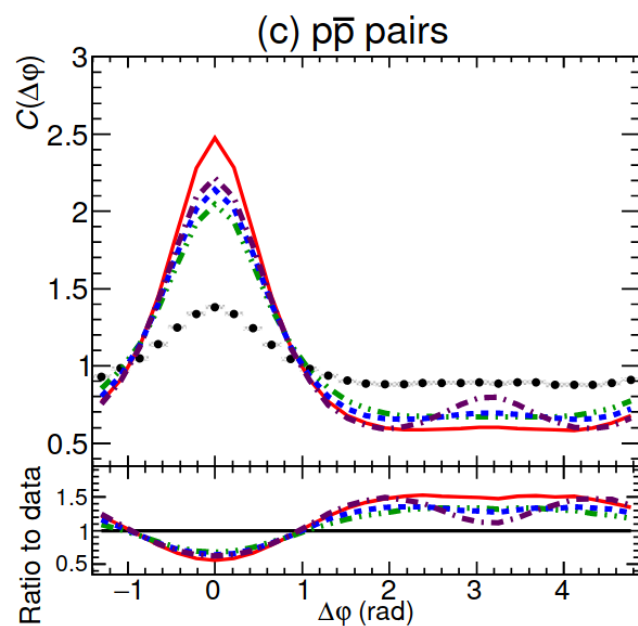
Action points:

→ Merging.

→ Usage in PoP analysis.

→ Updating flow framework with AO's (see separate).

Tools: Event mixing

Still at the level of CB's toy implementation.

No coherent way to handle weights.

One analysis (pp) implemented (1612.08975).

Action items

→ **Include or not? Useful as PoP, but only for pp and quite limited.**

→ **Attempt to handle event weights?**

→ **...or single analysis, unit weight use case.**

Tools: Flow

Full implementation of "Generic Framework" for single event correlators implemented.

On top of this, tools to extract event averaged cumulants/flow coefficients, one gap.

Support for pT differential, not yet eta-differential. PID lacking a bit.

Plays nicely with centrality framework.

Not fully compatible with reentrant finalize yet.

MC uncertainty based on "bootstrap" - which NEEDS correct reentrancy.

```cpp
namespace Rivet {

  /// @brief Multiparticle azimuthal correlations PbPb 5TeV.
  class ALICE_2016_I1419244 : public Analysis, Cumulants {
  public:

    /// Constructor
    DEFAULT_RIVET_ANALYSIS_CTOR(ALICE_2016_I1419244);


    /// @name Analysis methods
    //@{

    /// Book histograms and initialise projections before the run
    void init() {

      // Initialise and register projections
```

```cpp
// The centrality.
const double cent = centProj();

// The correlators projections.
const Correlators& c = applyProjection<Correlators>(event,"Correlators");
const Correlators& cp =
  applyProjection<Correlators>(event,"CorrelatorsPos");
const Correlators& cn =
  applyProjection<Correlators>(event,"CorrelatorsNeg");

ec22gap->fill(cent, cp, cn, w);
ec32gap->fill(cent, cp, cn, w);
ec42gap->fill(cent, cp, cn, w);
```

```cpp
// pT differential, with gap, 30-40% centrality.
ec22gappT = bookECorrelatorGap<2,2>(h_v22gappT);
ec32gappT = bookECorrelatorGap<3,2>(h_v32gappT);
ec42gappT = bookECorrelatorGap<4,2>(h_v42gappT);


pair<int, int> max = getMaxValues();
// Declare correlator projections.
declare(Correlators(cfs, max.first, max.second, h_v22gappT),
  "Correlators");
declare(Correlators(cfsp, max.first, max.second, h_v22gappT),
  "CorrelatorsPos");
declare(Correlators(cfsn, max.first, max.second, h_v22gappT),
  "CorrelatorsNeg");
```

```cpp
/// Normalise histograms etc., after the run
void finalize() {
    // Filling test histos.
    cnTwoInt(h_c22gap, ec22gap);
    cnTwoInt(h_c32gap, ec32gap);
    cnTwoInt(h_c42gap, ec42gap);
    cnFourInt(h_c24, ec22, ec24);
    cnSixInt(h_c26, ec22, ec24, ec26);
    cnEightInt(h_c28, ec22, ec24, ec26, ec28);
```

Tools: Flow
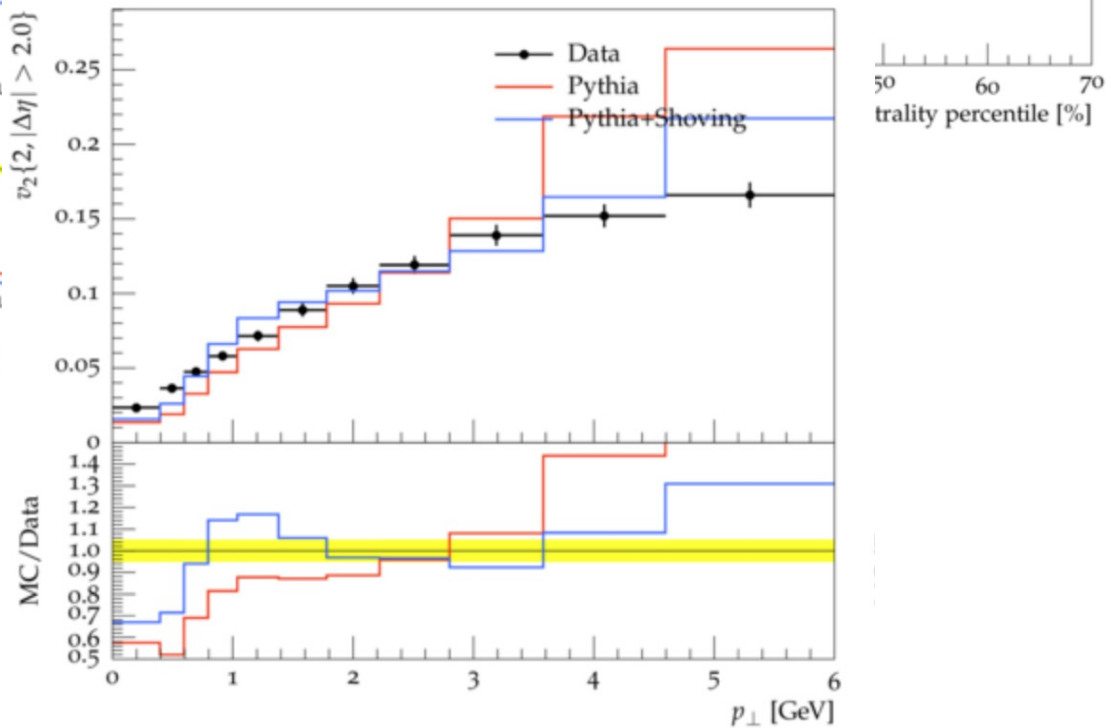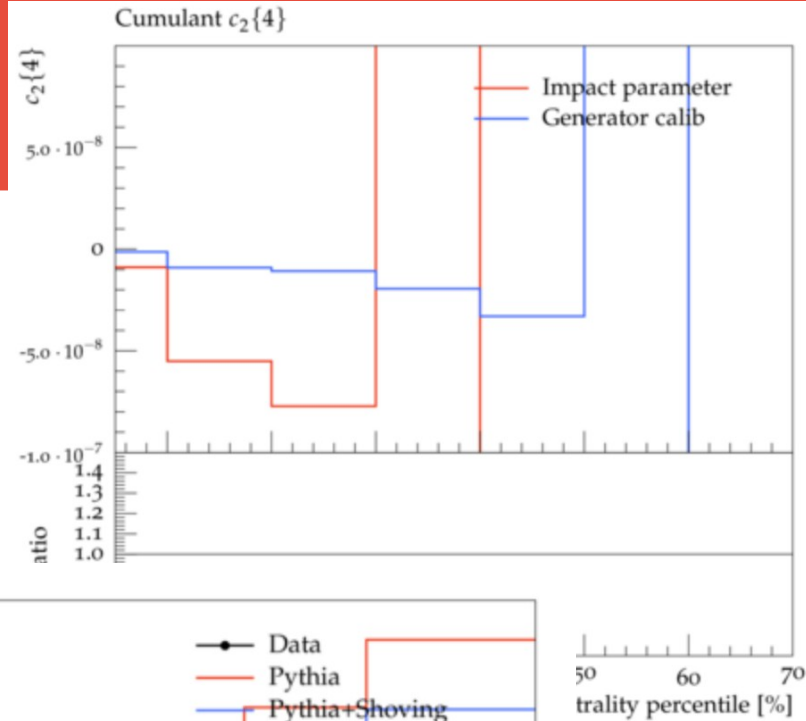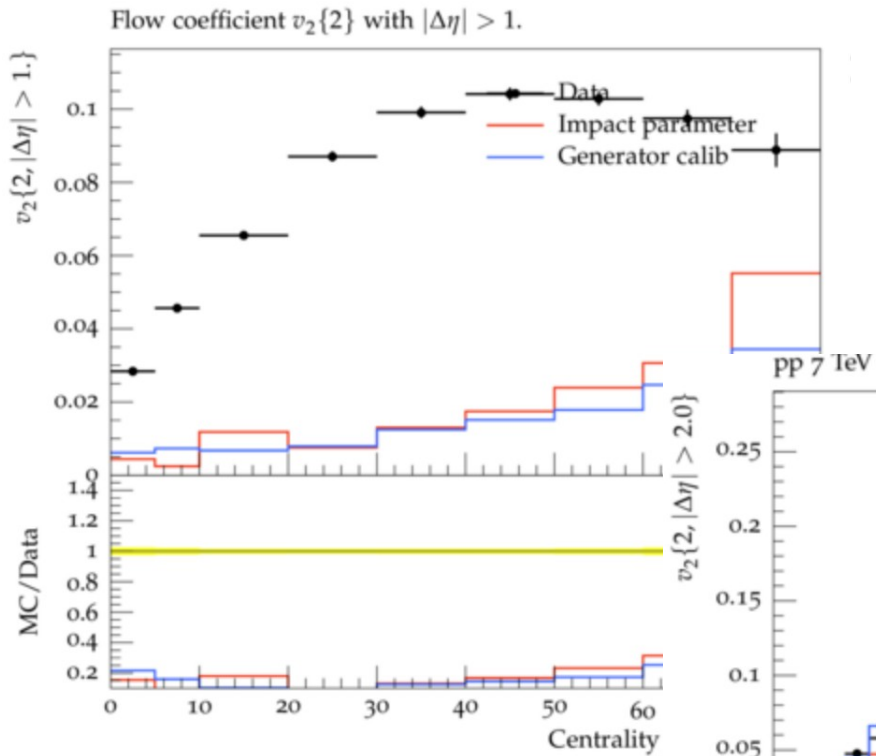
Action items

→ **Bring in accordance with reentrant finalize.**

→ **Correct reference flow for PID particles (some part).**

→ **Eta-dependence, (A)-symmetric cumulants, more eta-gaps (later?).**

Analyses

For release we would like at least 10 finalized analyses.

Tough following up on the CPH meeting, ideas appreciated :-).

Analyses

Suggested minimum:

1 -2 Centrality independent particle production.

3-4 dN/dEta centrality dependent (PbPb+XeXe+pPb)

2 Centrality dependent spectra.

3 Centrality dependent flow.

1 Strangeness enhancement

+ 3 CERN PoP analyses?

+ ? pp analyses?

Road to release

Hardest part – consolidation and release – is ahead.

Assign action items and deadlines – what can each commit to?

Return to release note after we are further – let it follow the flow from previous slide.