Centrality in Rivet

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See also *Eur.Phys.J.* **C80** (2020) 5, 485

Centrality in RIVET3

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2. Calibrated

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Assume X some experimental measure (e.g., forward N_{ch}, E_{T})

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- I.e., we need to know $\mathrm{d}N/\mathrm{d}X$ over σ_{viz} to determine $X \to c$ *per event*
- I.e., we need a calibration run to get $\mathrm{d}N/\mathrm{d}X$

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Pb–Pb Sum over $-3.7 < \eta < -1.7$ and $2.8 < \eta < 5.1$
p–Pb (Pb w/$y > 0$) $2.8 < \eta < 5.1$
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BRAHMS

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BRAHMS_2004_AUAUCentrality
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An example

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my-eg --projectile Pb \
 --target p \
 --energy 5023 \
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 -i p_Pb_5023_1k.hepmc \
 -p myeg_ALICE_p_Pb_5023_1k_calib.yoda \
 -o myeg_p_Pb_5023_1k_ptspec.yoda
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- Note selection of X via analysis option `:cent=GEN`

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Backups

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```
class MyAnalysis : public Analysis {
  MyAnalysis() : Analysis("MyAnalysis") {}
  void init() {
    declareCentrality(XProjection(),
                      "XCalibrationAnalysis",
                      "XName","C");
    declare(YProjection(),     "Y");
    declare(HepMCHeavyIon(),   "HI");
    auto centBins = {0.,5.,10.,20.,30.,40.,60.,80.,100.};
    book(_meanNpart,centBins)
    book(_meanY,    centBins);
    book(_result);
  }
  void analyze(const Event& event) {
    auto  cent  = apply<CentralityProjeciton>("C")();
    auto  y     = apply<YProjection>("Y")();
    auto& hi    = apply<HepMCHeavyIon>(event);
    auto  npart = hi.Npart_proj()+hi.Npart_targ();

    _meanNpart->fill(cent, npart);
    _meanY    ->fill(cent, y);
  }
  void finalize() {
    for (size_t i = 0; i < _meanNpart->bins().size(); i++)
       _result->addPoint(_meanNpart->bin().mean(),
                         _meanY    ->bin().mean(),
                         _meanNpart->bin().stdErr(),
                         _meanY    ->bin().stdErr());
  }
  Profile1DPtr _meanNpart;
  Profile1DPtr _meanY;
  Scatter2DPtr _result;
};
```