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Motivation

I_{CP} can give insight to in-medium energy loss and jet-quenching effects

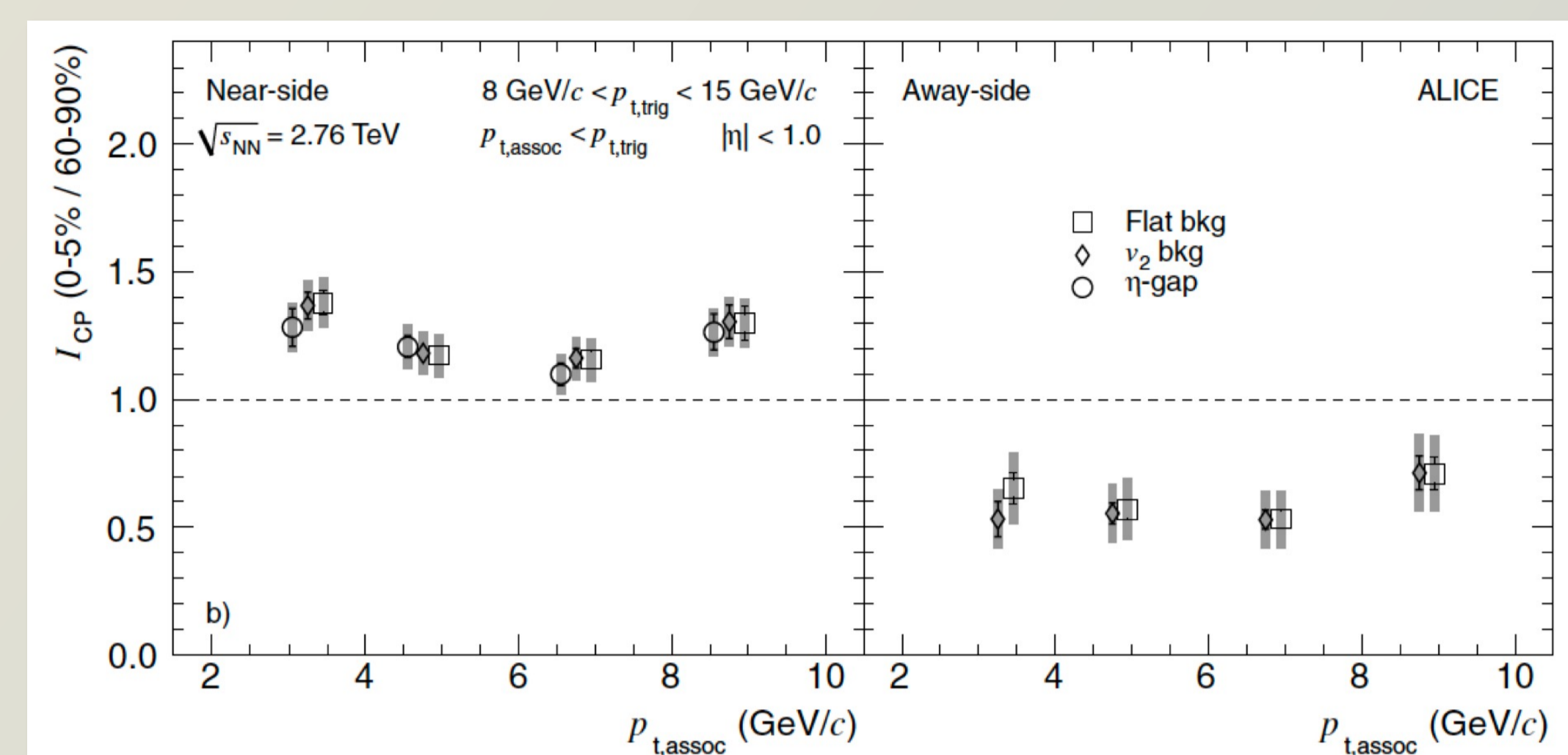
- An away-side suppression is attributed to the presence of **in-medium energy loss**.
- An enhancement above unity can possibly be attributed to the **recovery of quenched energy**.

Goals of this measurement:

- First measurement in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.36$ TeV.
- More differential measurements with respect to Run 1 are now possible thanks to the large amount of statistics in Run 3.

$$I_{CP} = \frac{Y_{\text{central}}}{Y_{\text{peripheral}}}$$

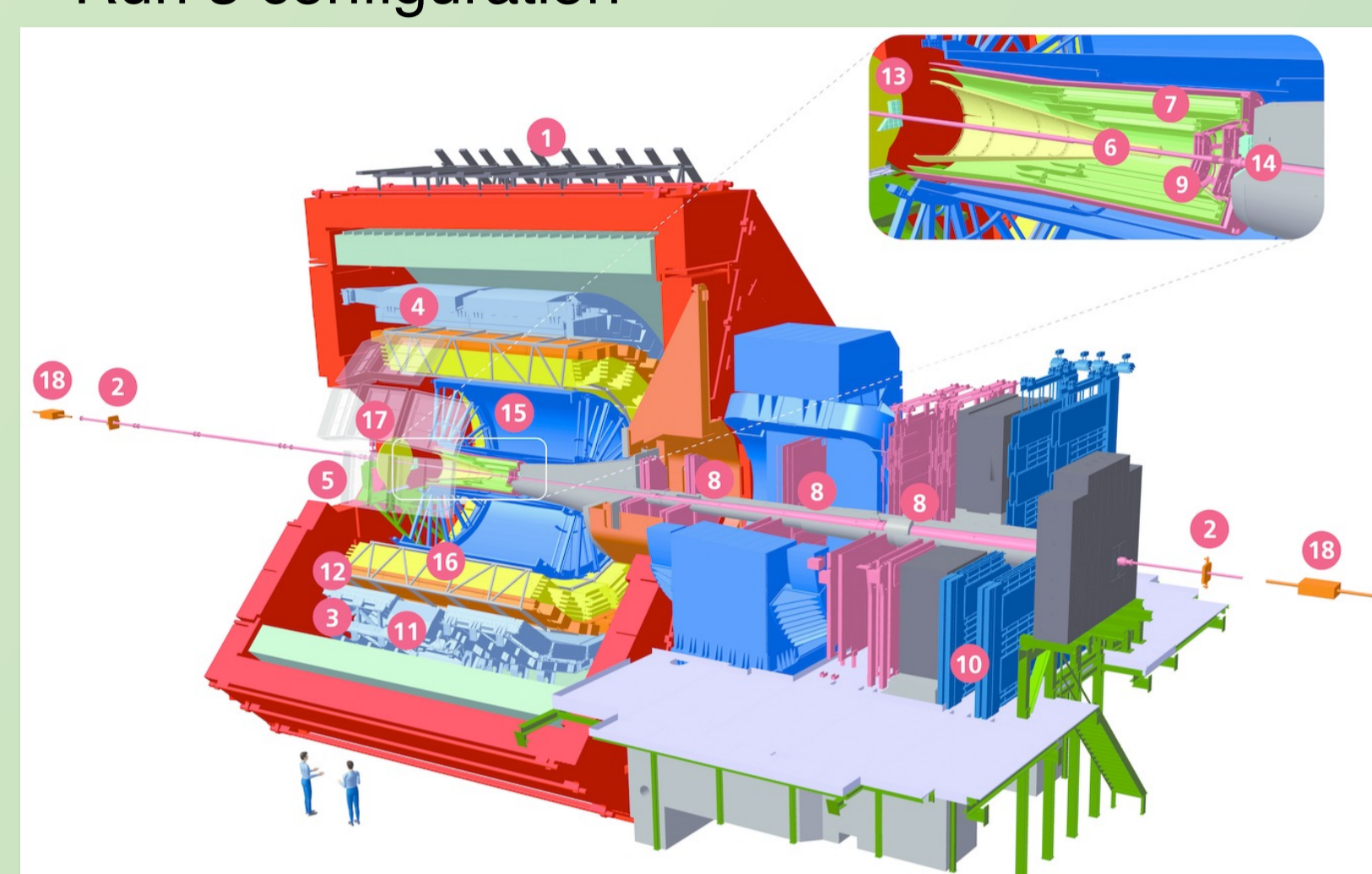
$Y \rightarrow$ yield



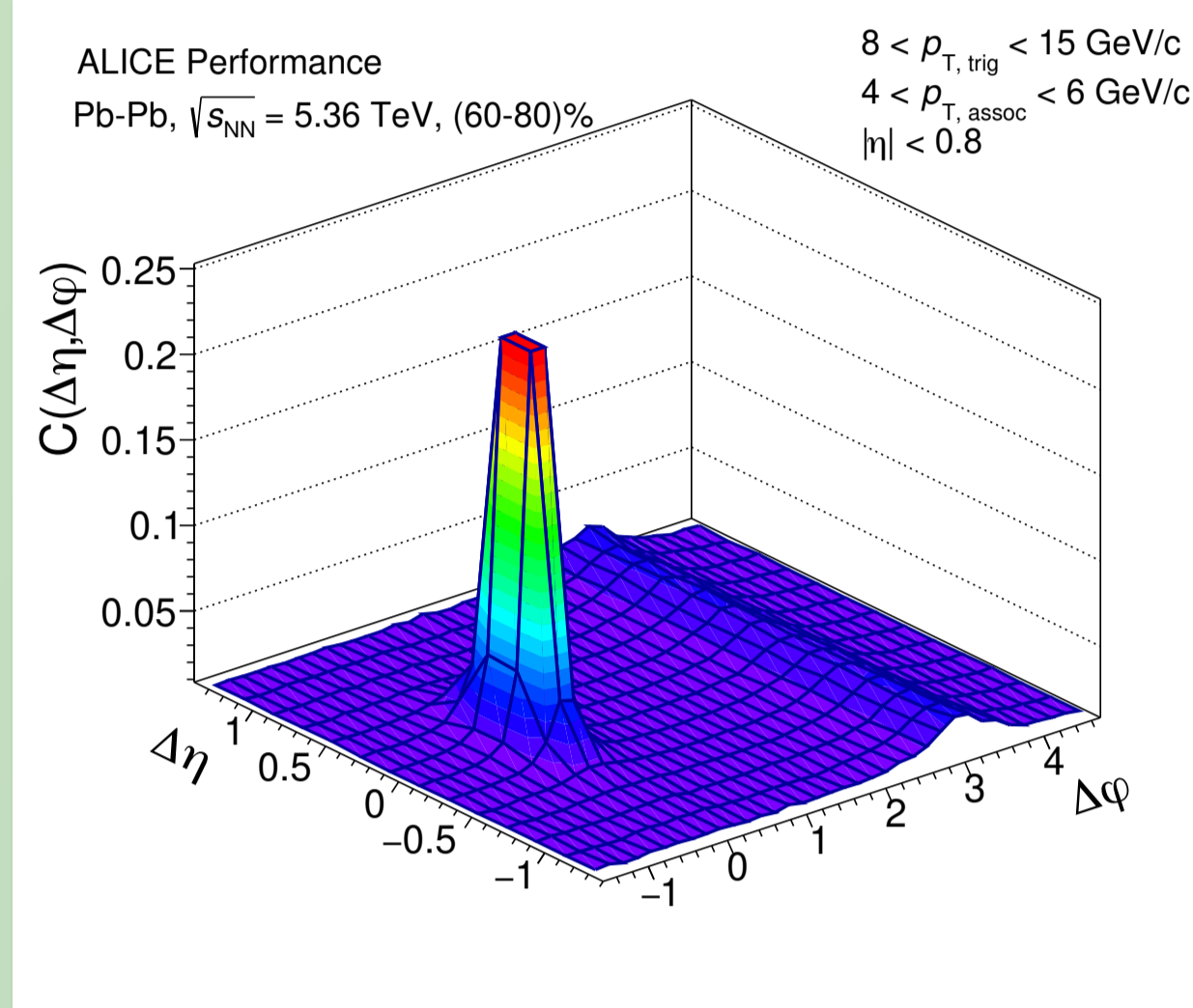
ALICE, Phys. Rev. Lett. 108 (2012) 092301

ALICE detector and analysis methodology

Run 3 configuration



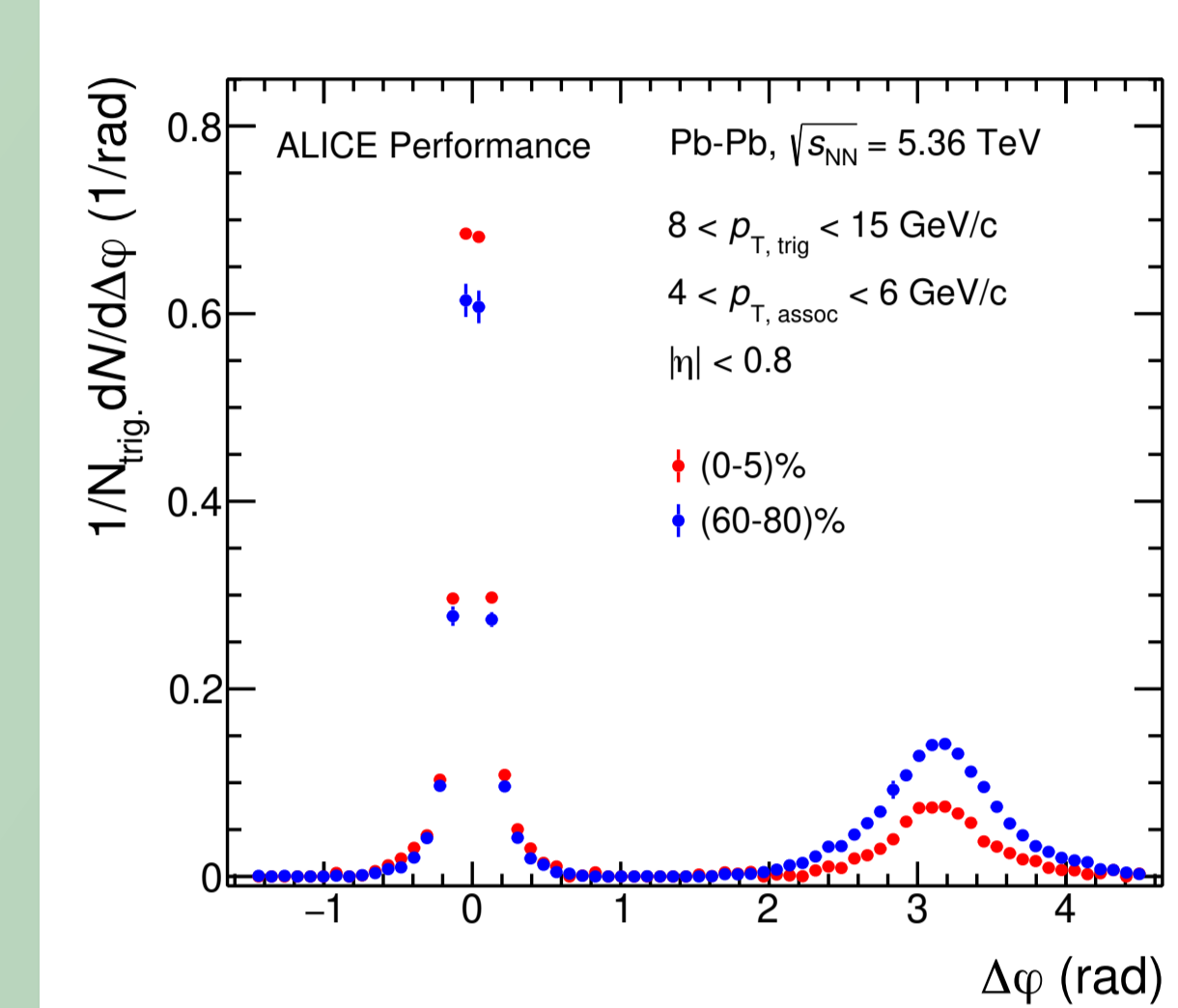
- ACORDE | ALICE Cosmic Rays Detector
- AD | ALICE Diffraction Detector
- DCA | Digit Calorimeter
- EMCAL | Electromagnetic Calorimeter
- HMPID | High Momentum Particle Identification Detector
- ITS-IB | Inner Tracking System - Inner Barrel
- ITS-OB | Inner Tracking System - Outer Barrel
- MCH | Muon Tracking Chambers
- MFT | Muon Forward Tracker
- MID | Muon Identifier
- PHOS / CPV | Photon Spectrometer
- TOF | Time Of Flight
- TPC | Time Projection Chamber
- TRD | Transition Radiation Detector
- V0+ | Vertex Detector
- ZDC | Zero Degree Calorimeter



$$\frac{1}{N_{\text{trig}}} \frac{d^2 N_{\text{assoc}}}{d\Delta\eta d\Delta\phi} = \frac{S(\Delta\eta, \Delta\phi)}{B(\Delta\eta, \Delta\phi)}$$

$$S(\Delta\eta, \Delta\phi) = \frac{1}{N_{\text{trig}}} \frac{d^2 N_{\text{same}}}{d\Delta\eta d\Delta\phi}$$

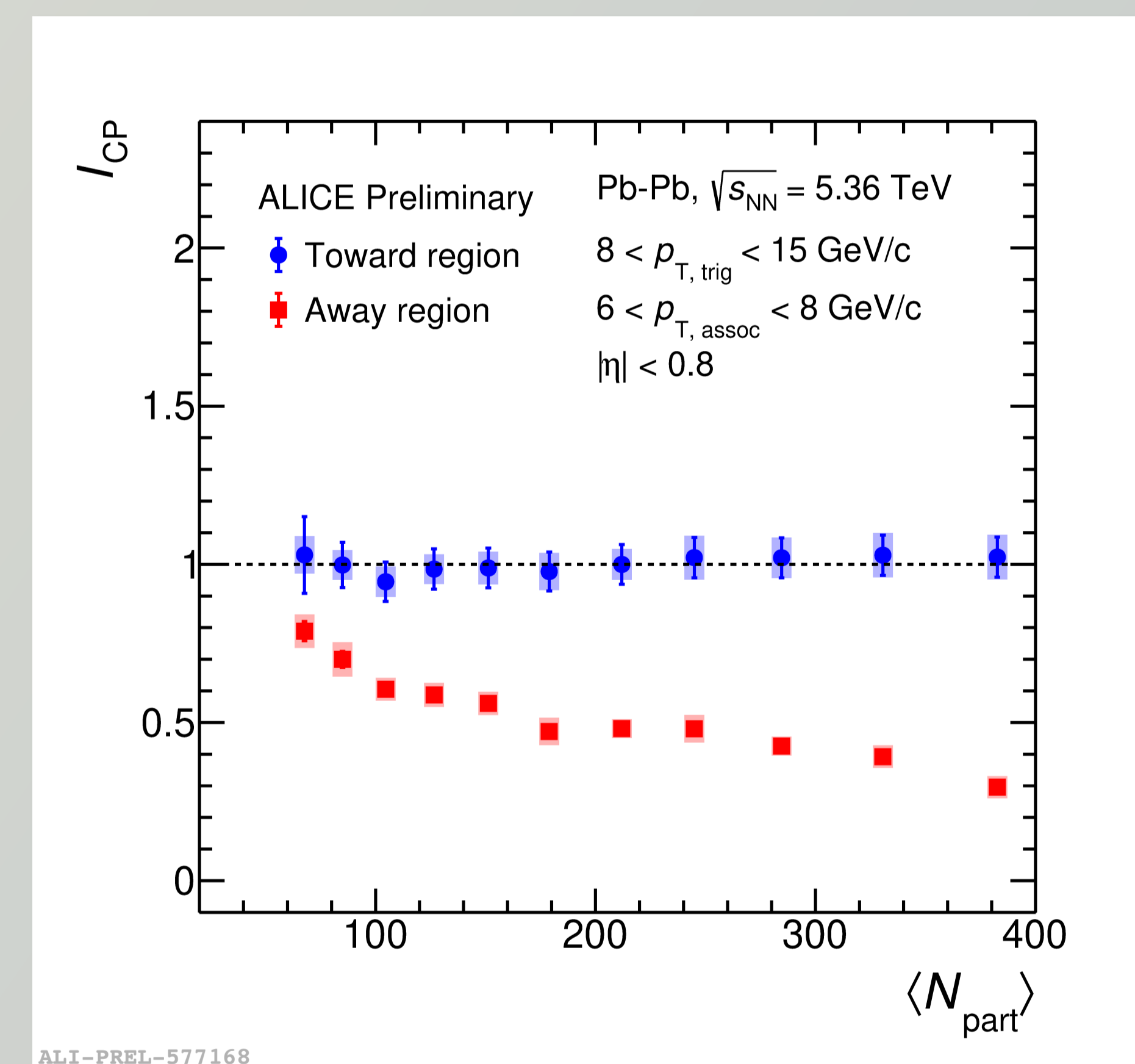
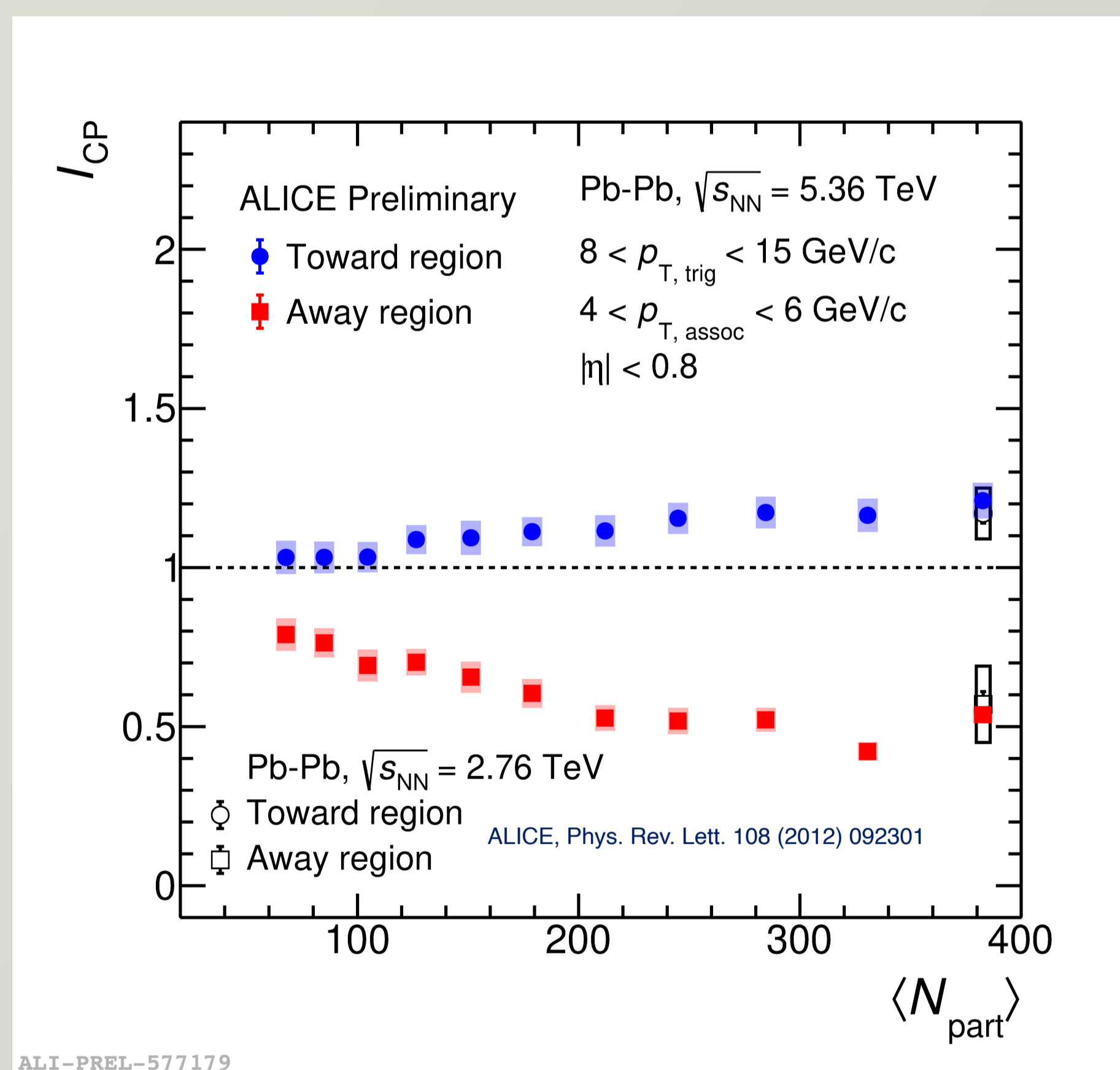
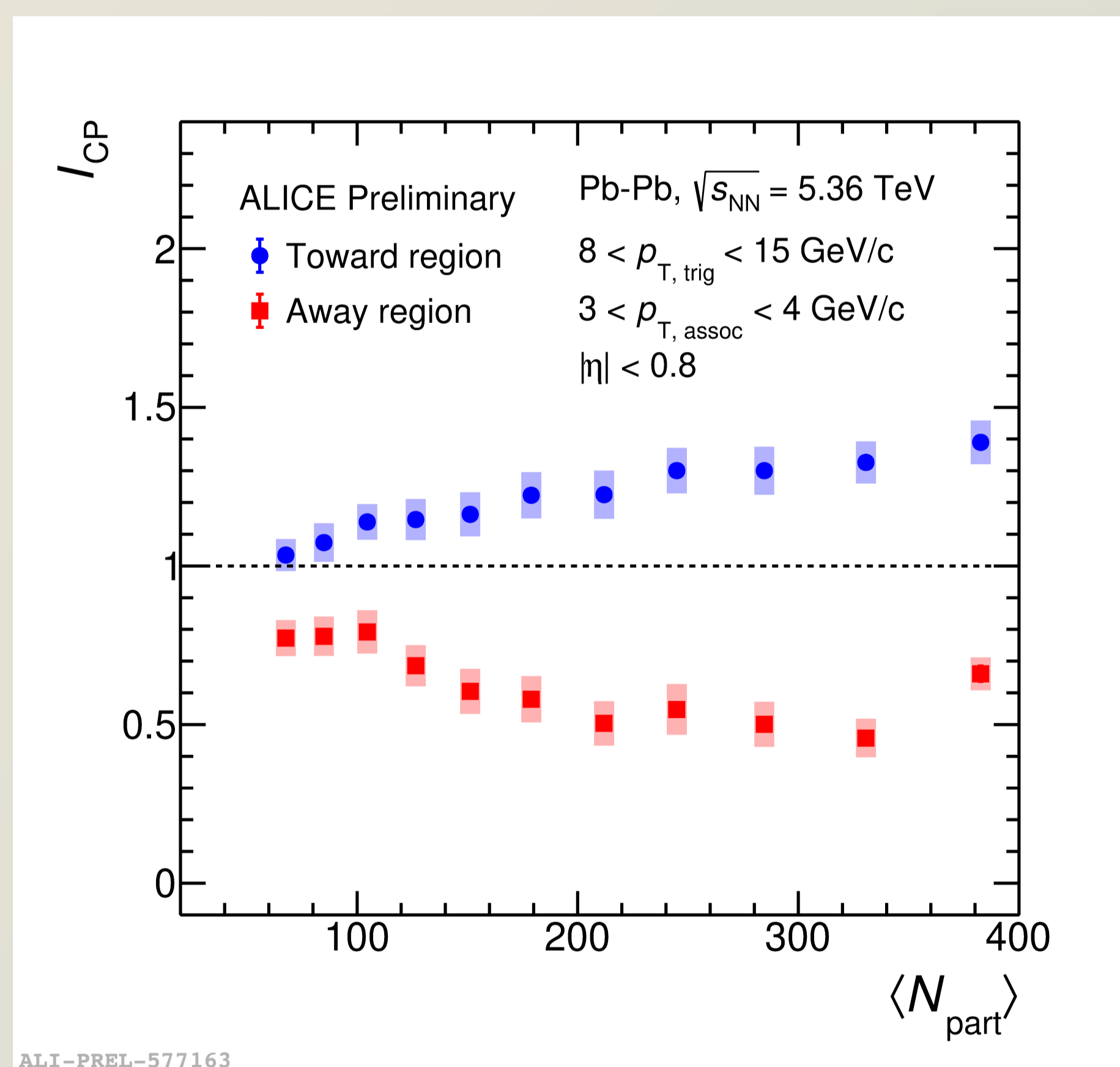
$$B(\Delta\eta, \Delta\phi) = \alpha \frac{1}{N_{\text{trig}}} \frac{d^2 N_{\text{mixed}}}{d\Delta\eta d\Delta\phi}$$



- Global tracking in ALICE: ITS and TPC.
- Tracks are accepted in the range $|\eta| < 0.8$.
- Centrality is estimated via TOC detector. For the denominator of I_{CP} measurement (60-80)% centrality is considered.

- $\Delta\phi$ distributions are obtained via 1D projection and the pedestal region is subtracted using zero-yield at minimum (ZYAM) method as done in previous measurements. (ALICE, Phys. Rev. Lett. 108 (2012) 092301)
- Yield (Y) in toward and away region is integral of $\Delta\phi$ distribution in $|\Delta\phi| < \pi/3$ and $|\Delta\phi| > 2\pi/3$, respectively.
- Contributions from $\Delta\eta$ -independent correlations are subtracted from the **toward** region by calculating the per-trigger pair yield in mid- $|\Delta\eta|$ region. For the **away** region, the background contribution is symmetrised from the toward region and correction for triangular flow contribution is also applied.

Results and discussion



- I_{CP} values show an enhancement and a clear suppression in toward and away regions for central collisions, respectively.
- With the increase in p_T , the enhancement in the toward region diminishes while the away regions show more suppression.
- I_{CP} values in Pb–Pb at 5.36 TeV are found to be similar to Pb–Pb at 2.76 TeV results within uncertainties.

Summary and outlook

- First I_{CP} measurements of charged particles as a function of centrality in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.36$ TeV are presented.
- The larger suppression of I_{CP} measurements in away region with increase in p_T indicates that the away side jet gets quenched significantly while it is not recovered in the toward region as the I_{CP} value is consistent to unity in high- p_T region across all centrality classes.
- Stay tuned for new results on I_{AA} (yield ratio from heavy-ion collisions to pp collisions) measurements in Run 3 of the LHC.