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Particle-yield modification in jet-like azimuthal V^0–hadron correlations in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE at the LHC

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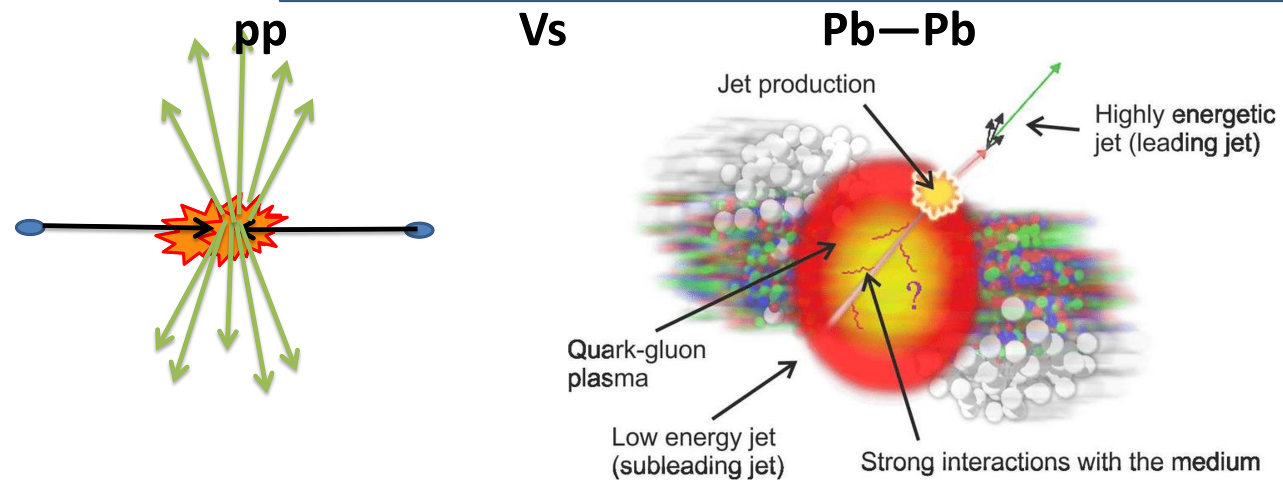
on behalf of ALICE Collaboration

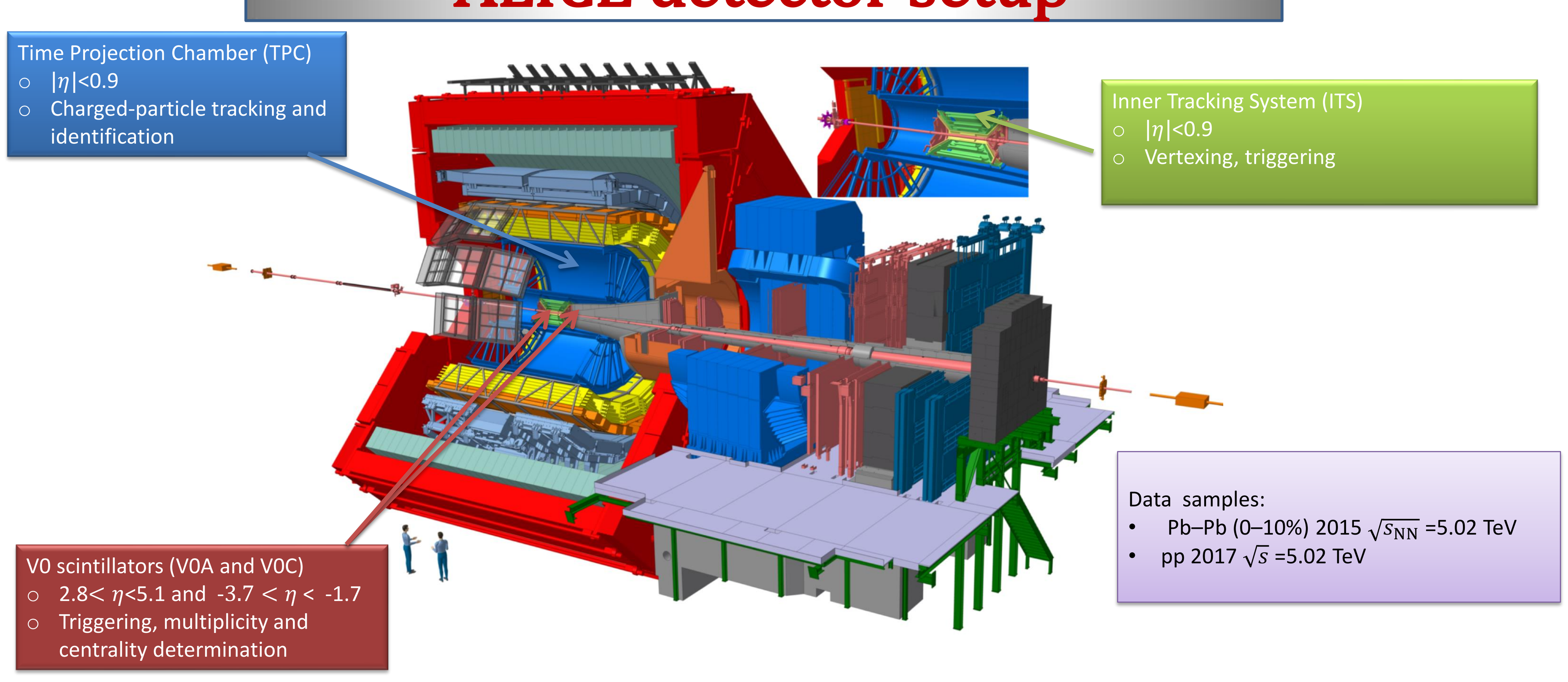
Motivation



$$I_{AA} = \frac{Y^{Pb-Pb}_{\Delta\varphi}}{Y^{pp}_{\Delta\varphi}}$$

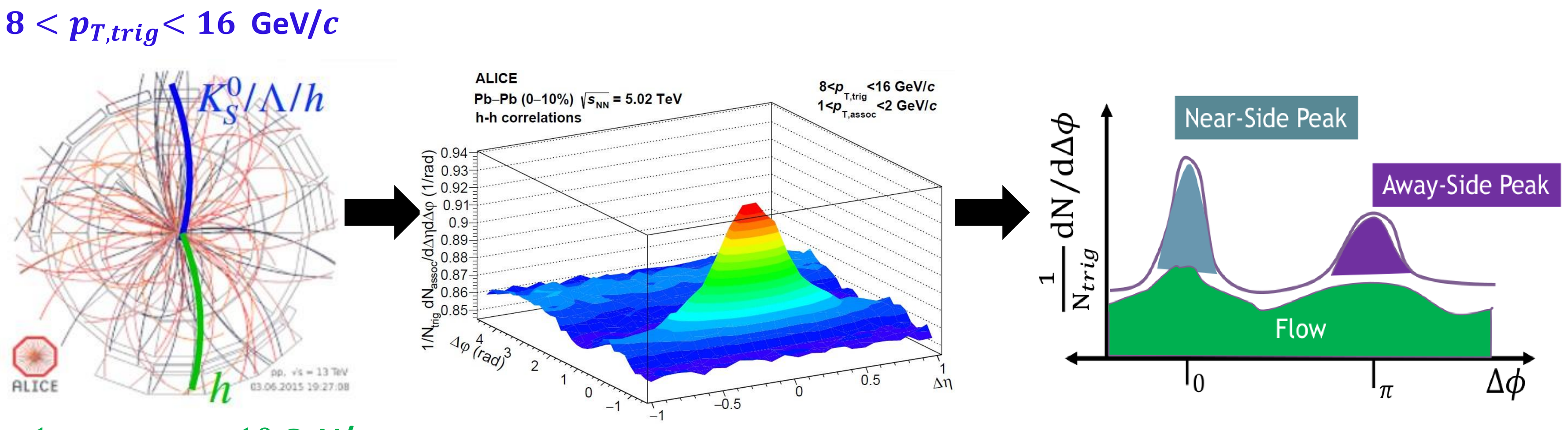
- on the away-side:
  The suppression of the yield is due to the energy loss in the QGP.
- on the near-side:
  I_{AA} provides information about the fragmenting jet leaving the medium.

ALICE detector setup



Strange- hadrons Correlations

$8 < p_{T,trig} < 16$ GeV/c



$1 < p_{T,assoc} < 10$ GeV/c

1. Agular correlation is mesured

$$C(\Delta\varphi, \Delta\eta) = \frac{1}{N_{trig}} \frac{d^2 N_{assoc}}{d\Delta\varphi d\Delta\eta} = \frac{S(\Delta\varphi, \Delta\eta)}{M(\Delta\varphi, \Delta\eta)}$$

$\Delta\varphi = \varphi_{trig} - \varphi_{assoc}$, $\Delta\eta = \eta_{trig} - \eta_{assoc}$

2. Background contribution is subtracted:

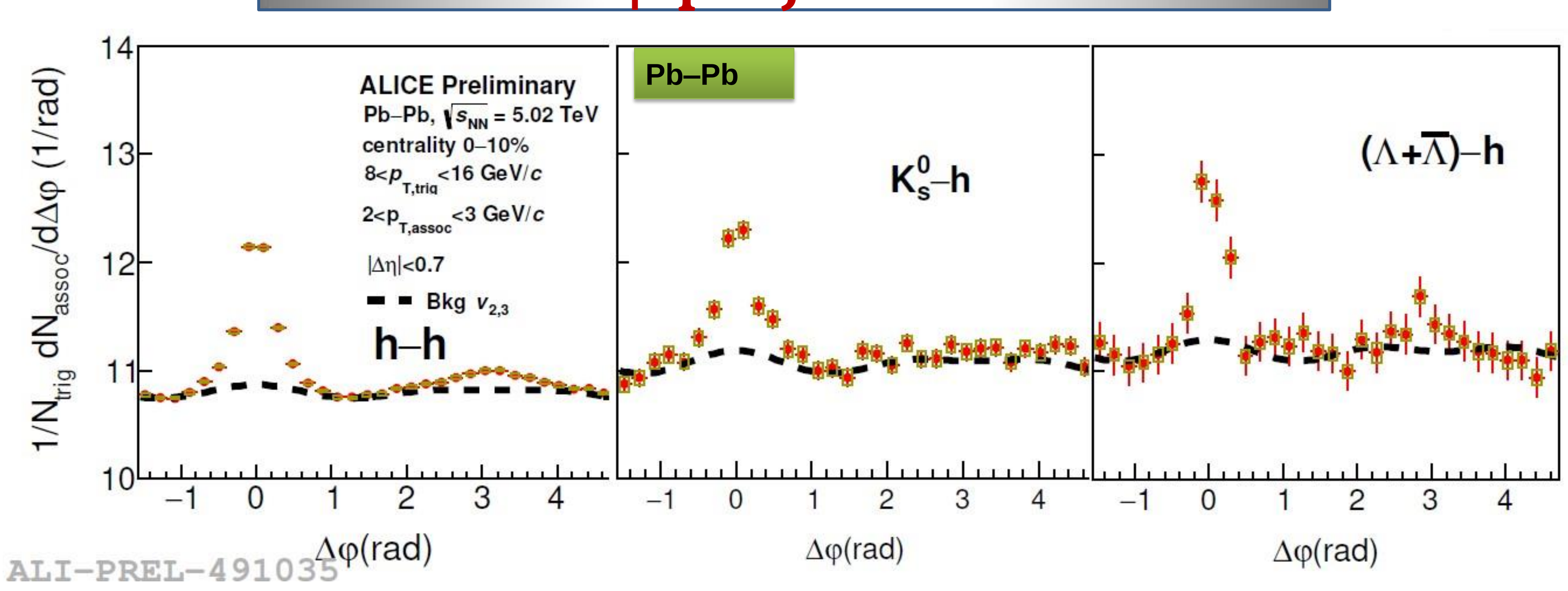
$$B(\Delta\varphi) = B_0 \left(1 + 2\sum_n V_n \cos(n\Delta\varphi)\right)$$

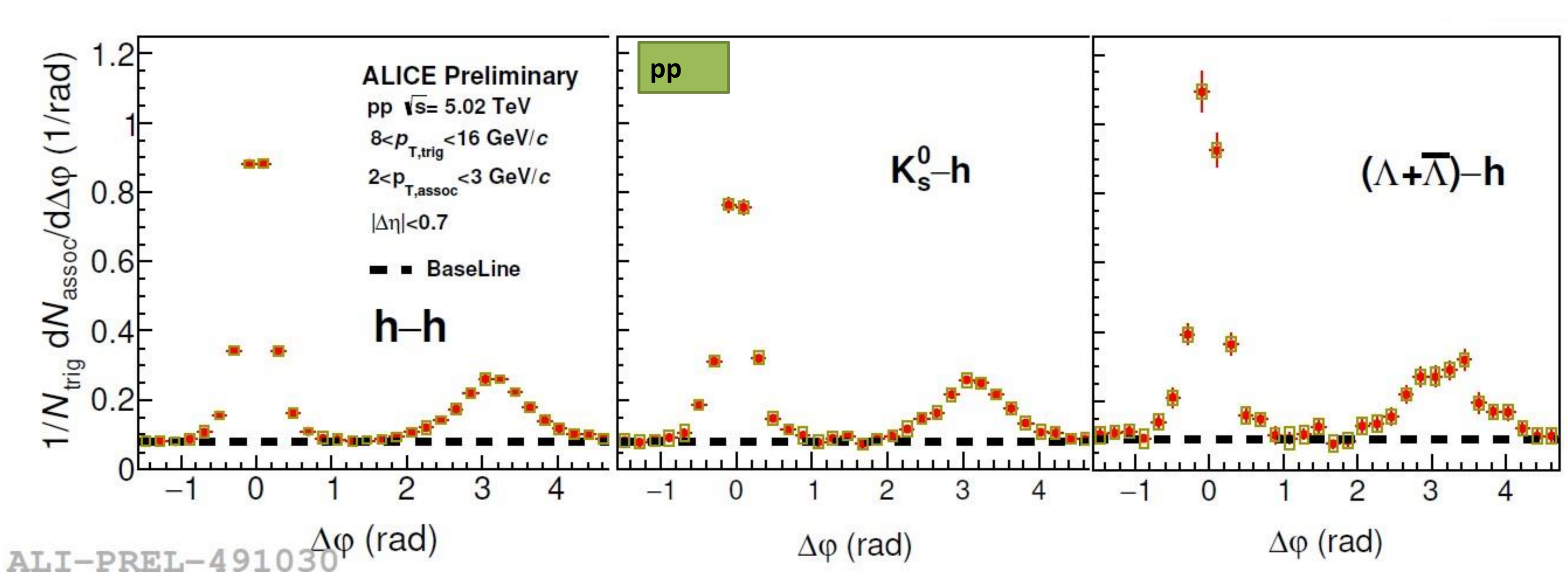
$V_n \approx v_n^{trig} . v_n^{assoc}$, n=2,3.

3. Jet is calculated

$$J(\Delta\varphi) = C(\Delta\varphi) - B(\Delta\varphi)$$

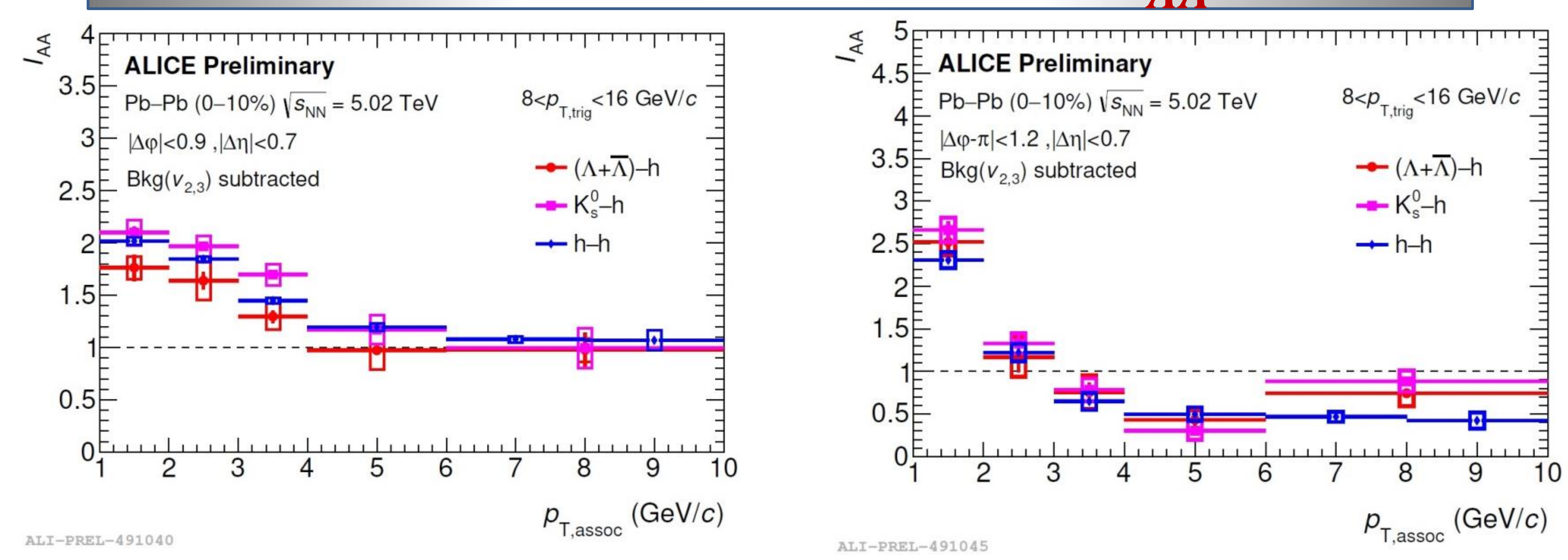
Δφ projections



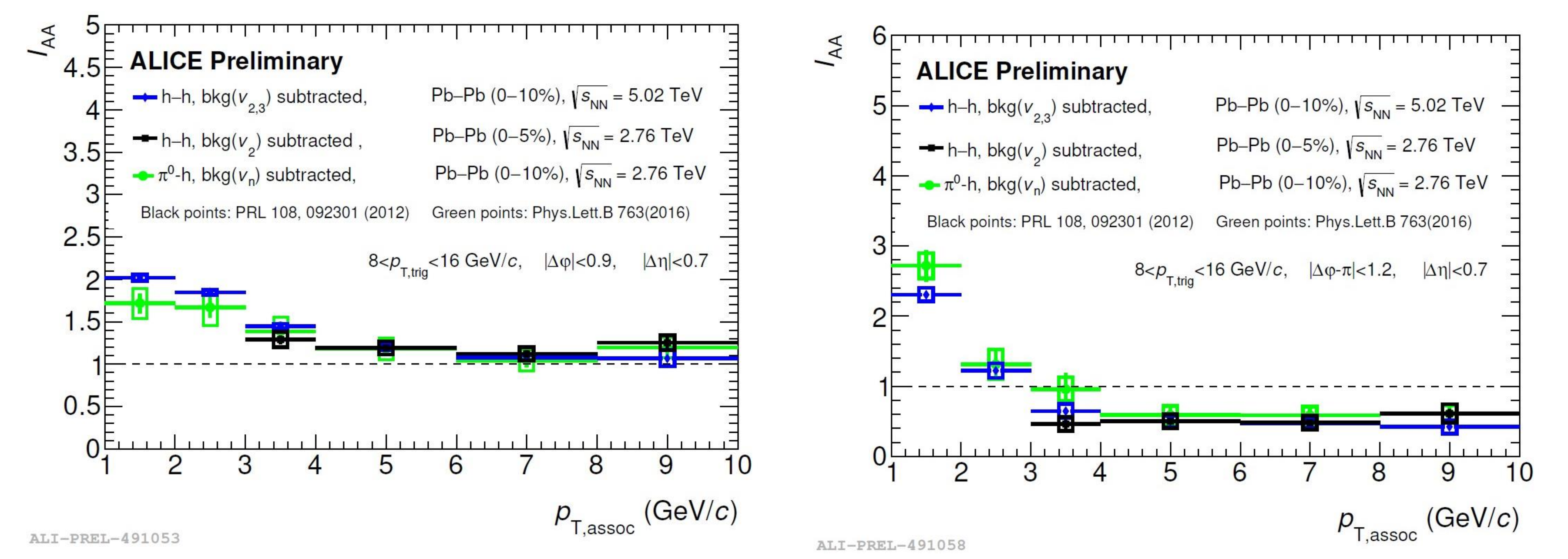


- Strongly suppression in the away –side for Pb–Pb collisions in contrast to the pp due to energy loss [1][2]

Nuclear modification factor I_{AA}

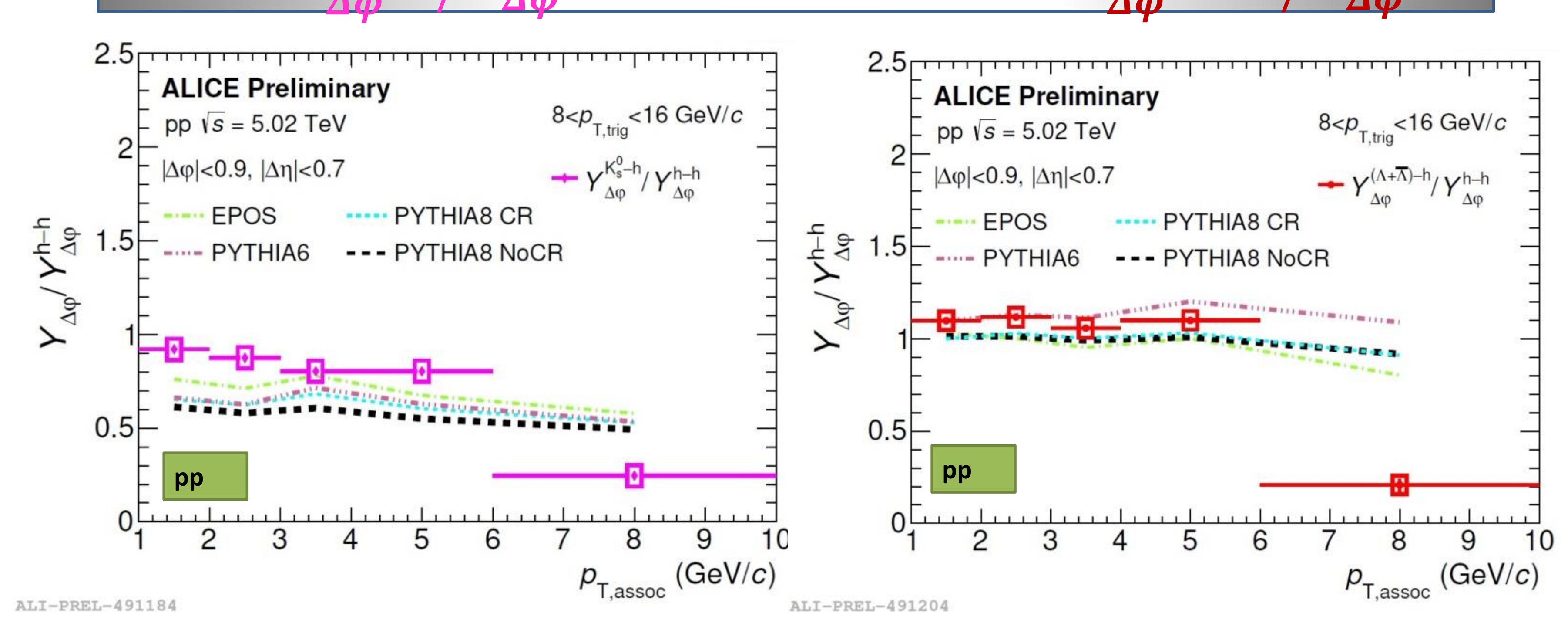


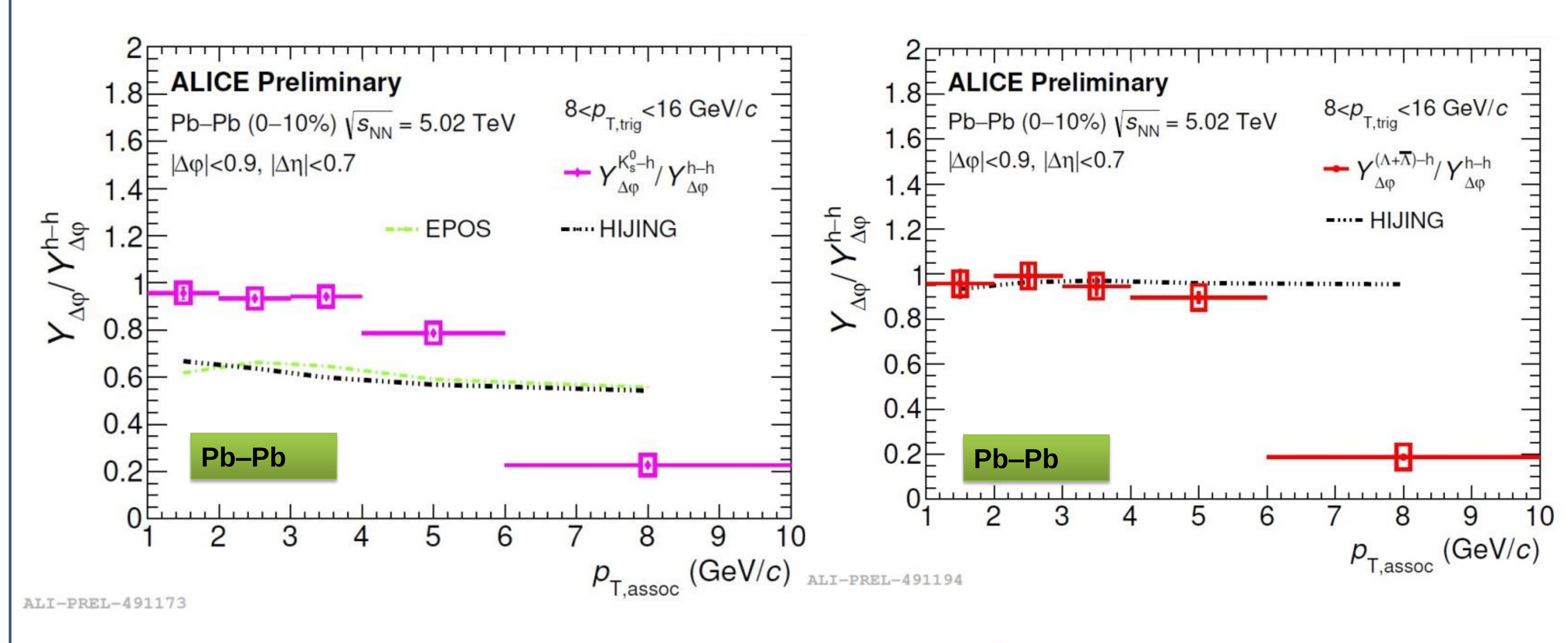
- **Near-side**
  strong enhancement at low $p_{T,assoc}$ &
  no modifications at high $p_{T,assoc}$
- **Away-side**
  strong enhancement at low $p_{T,assoc}$ &
  strong suppression at high $p_{T,assoc}$
- no significant specie- dependence in I_{AA} within uncertainties



- new measurement consistent with previous ones at $\sqrt{s_{NN}} = 2.76$ TeV

$Y^{K^0_s-h}_{\Delta\varphi}/Y^{h-h}_{\Delta\varphi}$ $Y^{(\Lambda+\bar{\Lambda})-h}_{\Delta\varphi}/Y^{h-h}_{\Delta\varphi}$





- Near-side yield ratios show the same trend for both K^0_s and $(\Lambda + \bar{\Lambda})$ in pp and Pb-Pb
- The difference in the ratio may caused by the difference between quark and gluon jet and the ratio in case of K^0_s always under unity for both pp and Pb–Pb[3]
- Most of the models qualitatively describe the ratios in pp .

Summary

- I_{AA} shows strong enhancement at low $p_{T,assoc}$ in near-side and away-side for all particles species
- I_{AA} shows strong suppression at high $p_{T,assoc}$ in away-side for all particles species
- I_{AA} shows no significant specie-dependence specially in away-side.
- A difference between jet-like yields triggered with K^0_s and Λ with respect to charged hadron The difference in the ratio may caused by the difference between quark and gluon jet

References

1. ALICE Collaboration, Particle-Yield Modification in Jetlike Azimuthal Dihadron Correlations in Pb-Pb Collisions at $\sqrt{s_{NN}}$ =2.76 TeV , Phys-Rev-Lett.108.092301.
2.ALICE Collaboration, Jet-like correlations with neutral pion triggers in pp and central Pb–Pb collisions at at $\sqrt{s_{NN}}$ =2.76 TeV, physics-letters-B.763.
3 K^0_s and $(\bar{\Lambda})$ -hadron correlations in *pp* collisions $\sqrt{s}$ =13 TeV, arxiv 2107.11209

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