



# Charged-particle multiplicity dependence of $\Xi(1530)^0$ production in pp collisions at $\sqrt{s} = 13$ TeV with ALICE

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## $\Xi(1530)^0$ RESONANCE

**RESONANCE** yields are influenced by **Chemical freeze-out temperature ( $T_{ch}$ )**, **Lifetime of Hadronic Phase**, **Lifetime of resonance itself**, **Scattering cross-sections of decay products in the hadron gas**.

Mass	Lifetime	
$\phi$ (ss)	1019 MeV/c <sup>2</sup>	46.3 $K^+ K^-$ (49.2%)
$\Xi(1530)$ (uss)	1531 MeV/c <sup>2</sup>	21.7 $\pi^+ \Xi^-$ (66.7%)
$\Lambda^*$ (uds)	1520 MeV/c <sup>2</sup>	12.6 $p K^-$ (22.5%)
$\Xi(1820)$ (uss, dss)	1823 MeV/c <sup>2</sup>	8.2 $K \Lambda$ (unknown)
$\Sigma^*$ (uus, dds)	5 $\pi \Lambda$ (87%)	1387 MeV/c <sup>2</sup>
$f_0$ (unknown)	990 MeV/c <sup>2</sup>	-5 Lifetime has a large uncertainty $\pi^+ \pi^-$ (46%)
$K^{*0}$ (ds)	4.2 $K^+ \pi^-$	896 MeV/c <sup>2</sup> (66.6%)
$K^{*+}$ (us)	4.0 $K^0 \pi^+$	892 MeV/c <sup>2</sup> (66.6%)
$\rho$	$\pi^+ \pi^-$	770 MeV/c <sup>2</sup> (100%)
$(u\bar{u} - d\bar{d})/\sqrt{2}$		

## Regeneration

: pseudo-elastic scattering through resonance state

→ **Enhanced yield**

## Re-scattering

: elastic scattering smears out mass peak

→ **Reduced yield**

$\Xi(1530)^0$

## HADRON GAS

(most) Hadron yields fixed  
momenta change

## Kinetic Freeze-out

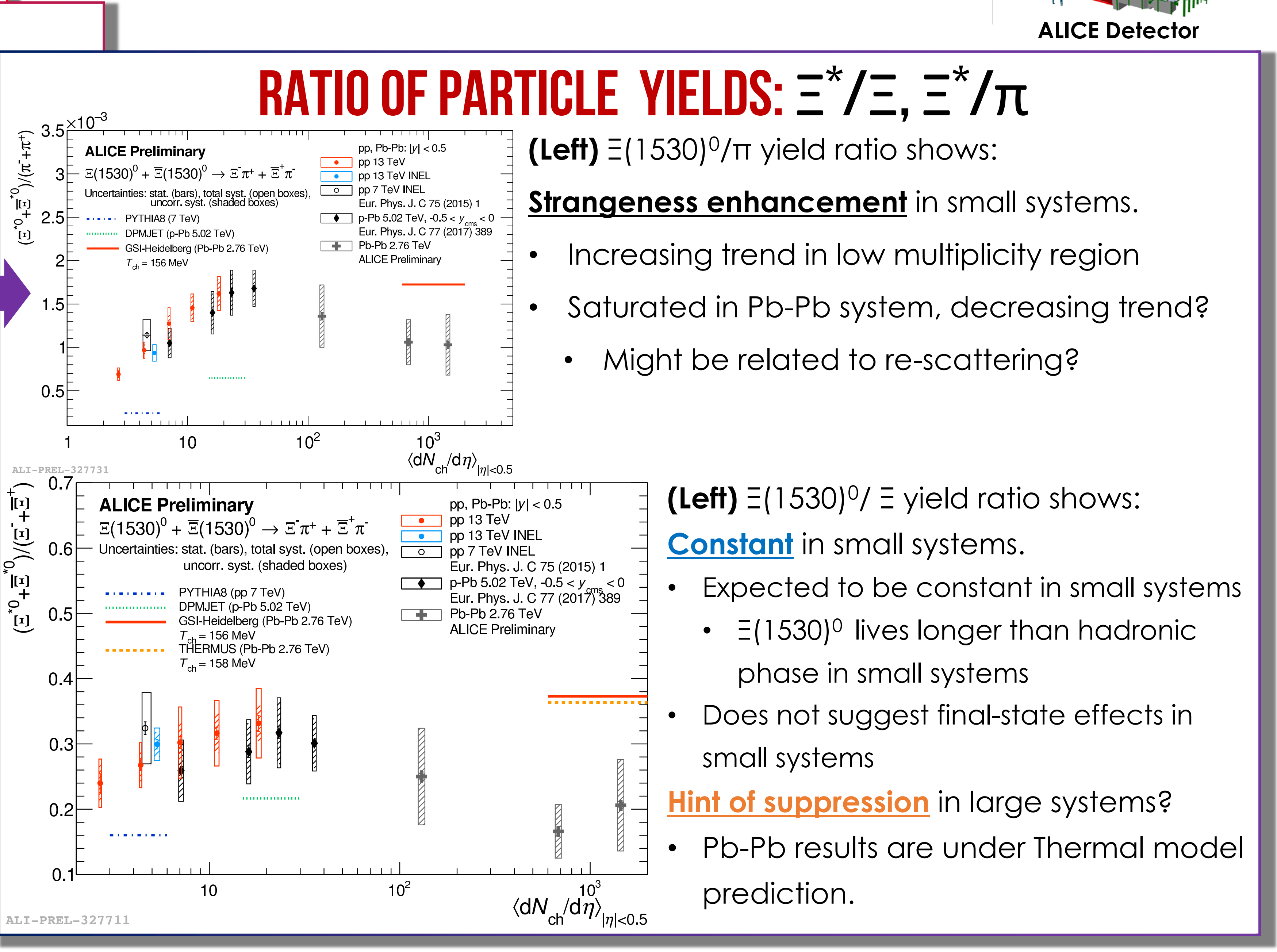
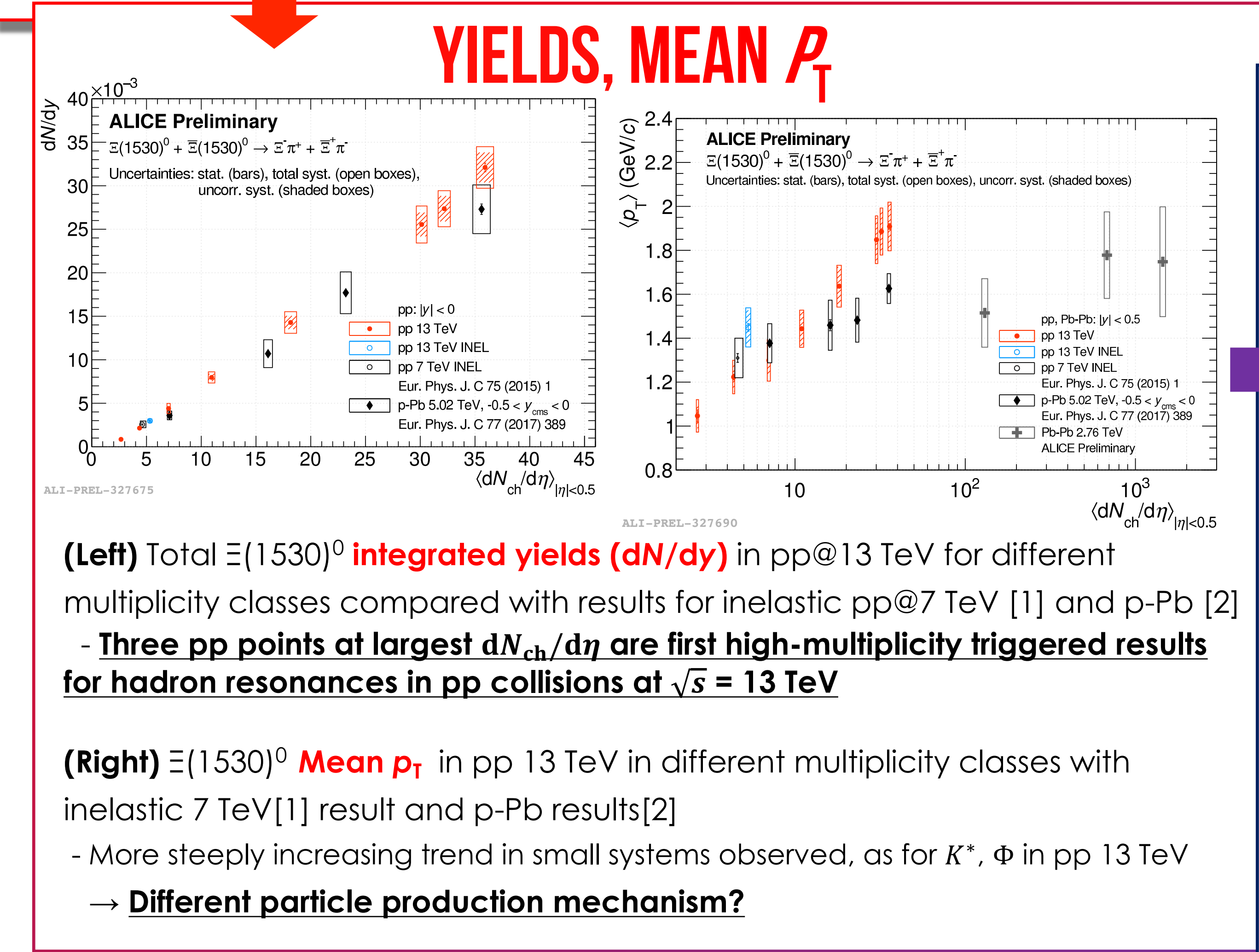
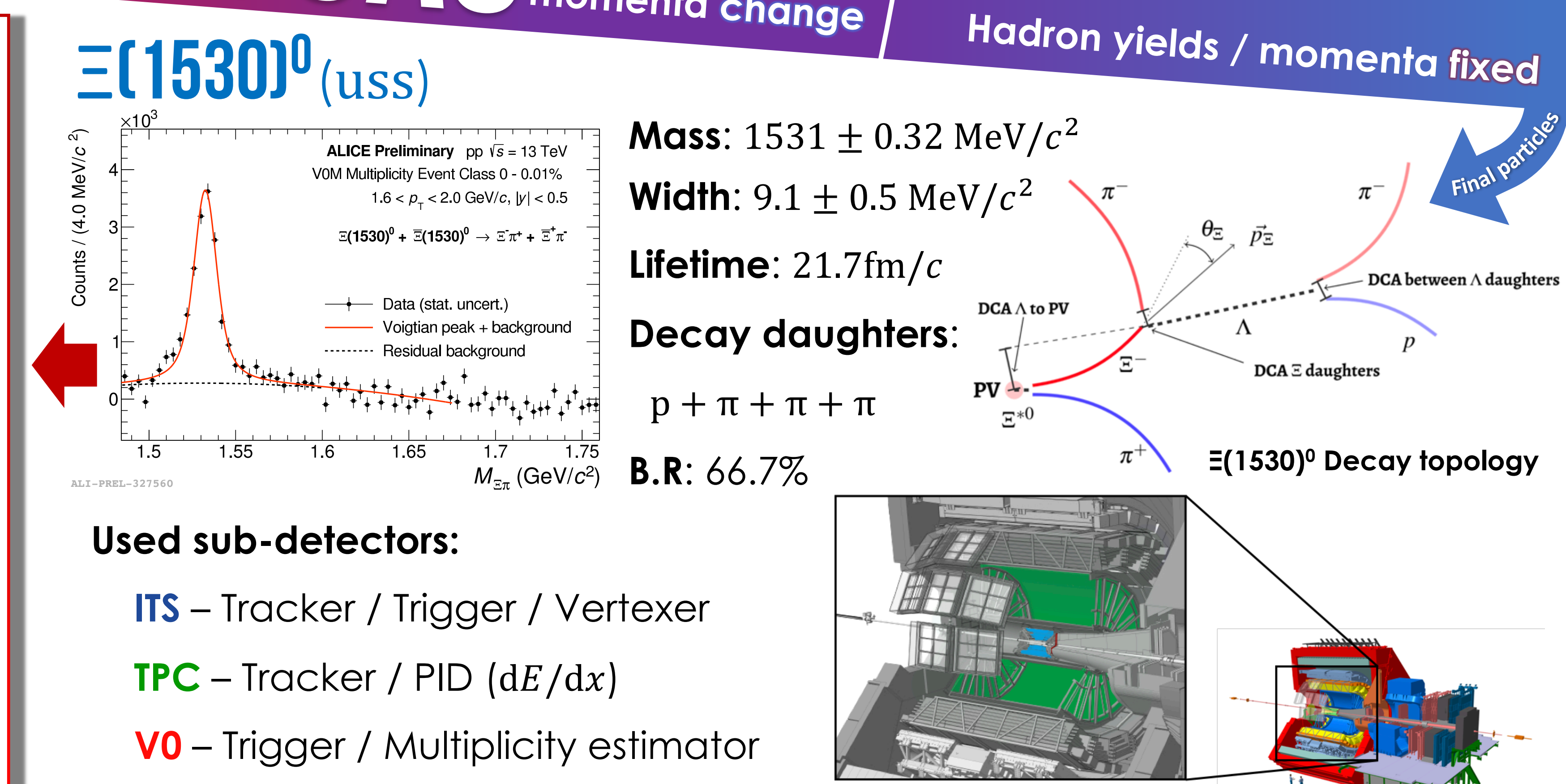
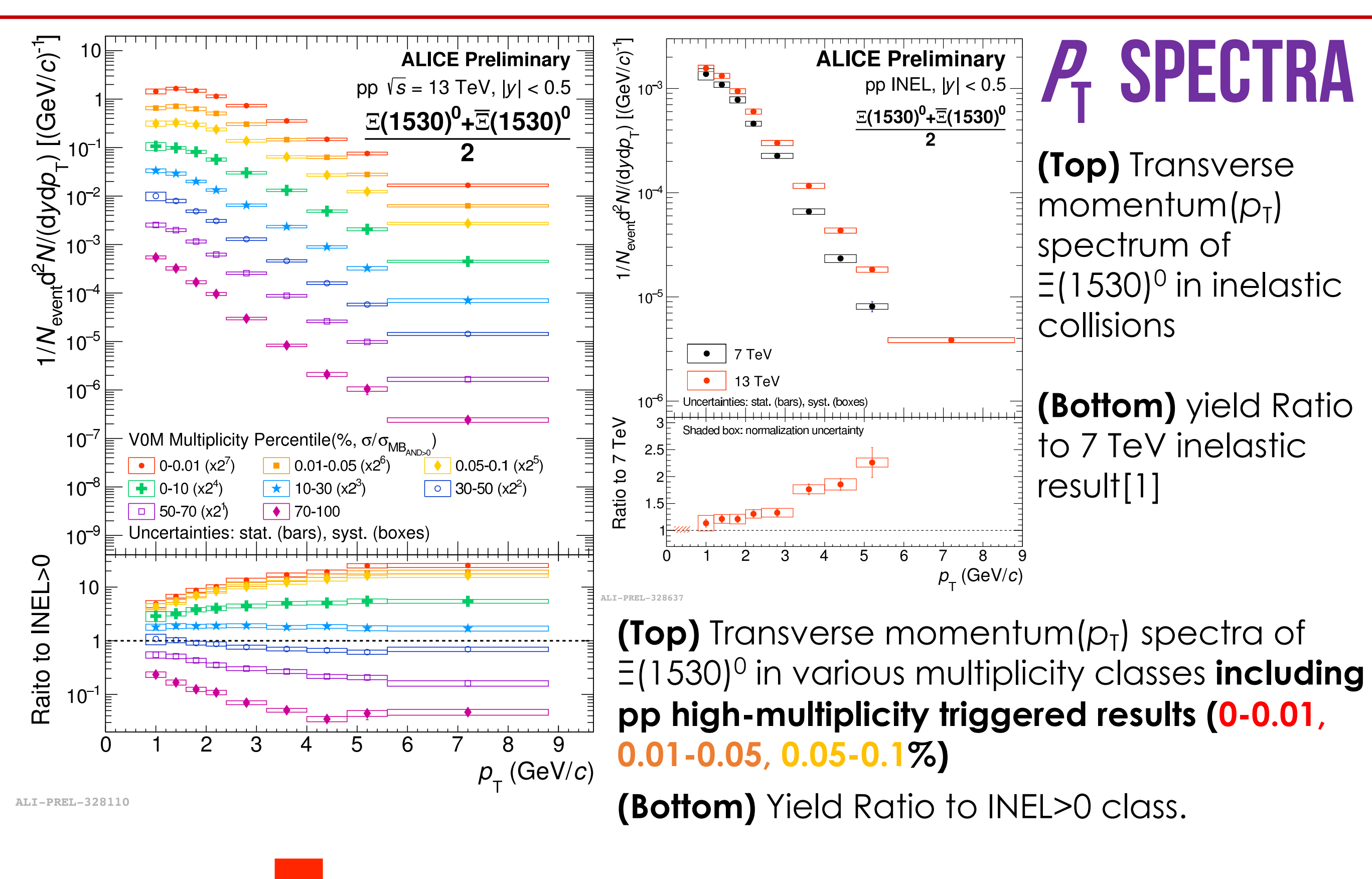
Hadron yields / momenta fixed

Quark  
Gluon  
Plasma

Phase transition

Hadron yields change  
momenta change

Chemical Freeze-out



## REFERENCES

- [1] ALICE Collaboration, Abelev, B. et al. Eur. Phys. J. C (2015) 75: 1. <https://doi.org/10.1140/epjc/s10052-014-3191-x>
- [2] ALICE Collaboration, Adamová, D. et al. Eur. Phys. J. C (2017) 77: 389. <https://doi.org/10.1140/epjc/s10052-017-4943-1>