

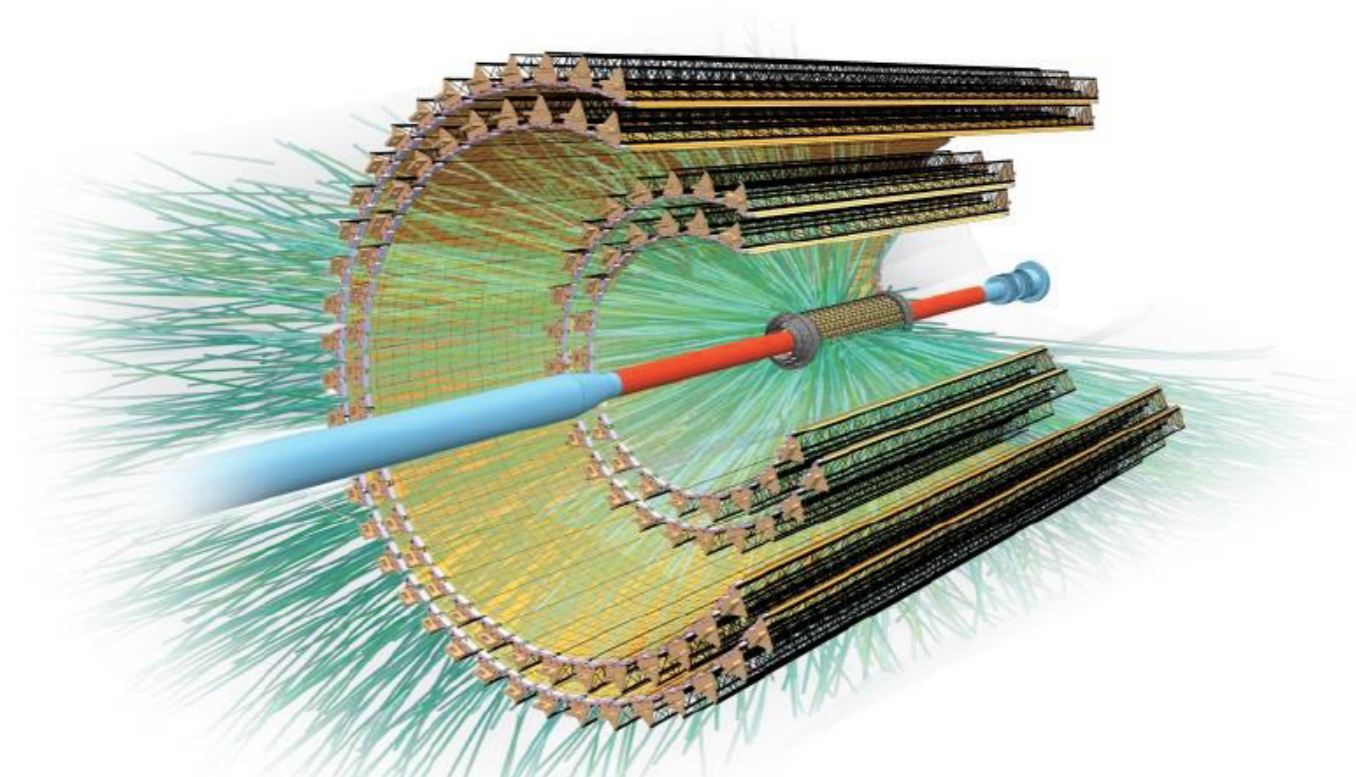


ALICE ITS and Beyond

KoALICE

KoALICE 2030 Proposal

by In-Kwon YOO - Pusan National Univ.



KoALICE (PNU/CNU) 2019 - 2020

KoALICE2030



KoALICE

- PNU/CNU Coordinator @ CERN: Bonghwi LIM
- Detector Operation (RO Experts) for 2019 -
 - Vit Kucera (PhD) for front-end (resident at CERN)
 - Beomkyu KIM (PhD) for back-end (resident at CERN)
- Simulation and Reconstruction for 2019 -
 - Junlee KIM (PhD Stud.) for Calibration (remote + visit CERN) Jan.'19 + Jul.'19
 - Minjae KWON (MA Stud.) for ITS DB (remote + visit CERN)
- Assembly and Commissioning on Surface (Detector Barrel Commissioning) + Installation in cavern





Scientific Advance is more often
driven by the development of a
NEW tool than a new concept

- Freeman Dyson

- **New era! with Silicon**
- **Opening Multi-Charm Era in Heavy Ion Collisions**

ALICE RUN3

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2019

2020

2021

2022

2023

LS2 - ITS2 installation

RUN3

$\sqrt{s_{NN}} = 2.7 \text{ .. } 5.5 \text{ TeV}$

- Luminosity (avrg) $\sim 2.4 \times 10^{27} / \text{cm}^2\text{s}$
- int. Luminosity $\sim 10/\text{nb}$ (=10¹¹ interactions) PbPb $\sim 10 \times \text{RUN1\&2}$
- charmed / strange-charmed / double-charmed / strange-cc / ccc / charmed-beauty / cc-b / c-bb ... at low pT
- Charm Enhancement? Canonical suppression? dN/dη-scaling?
- Quarkonia at low pT: X_c, X_b
- Exotics: X(3872), Z_c(3900), Y(4140) ...

- Silicon R&D oriented LAB. towards ITS3 (ALICEs)
 - dedicated Post-Doc(s)
 - Engineer for long term (~10 yrs)
 - A new clean room + Bonding machine + others
 - (Modification of Probe card for MVD)
- Exploring QCD diagram with Charm

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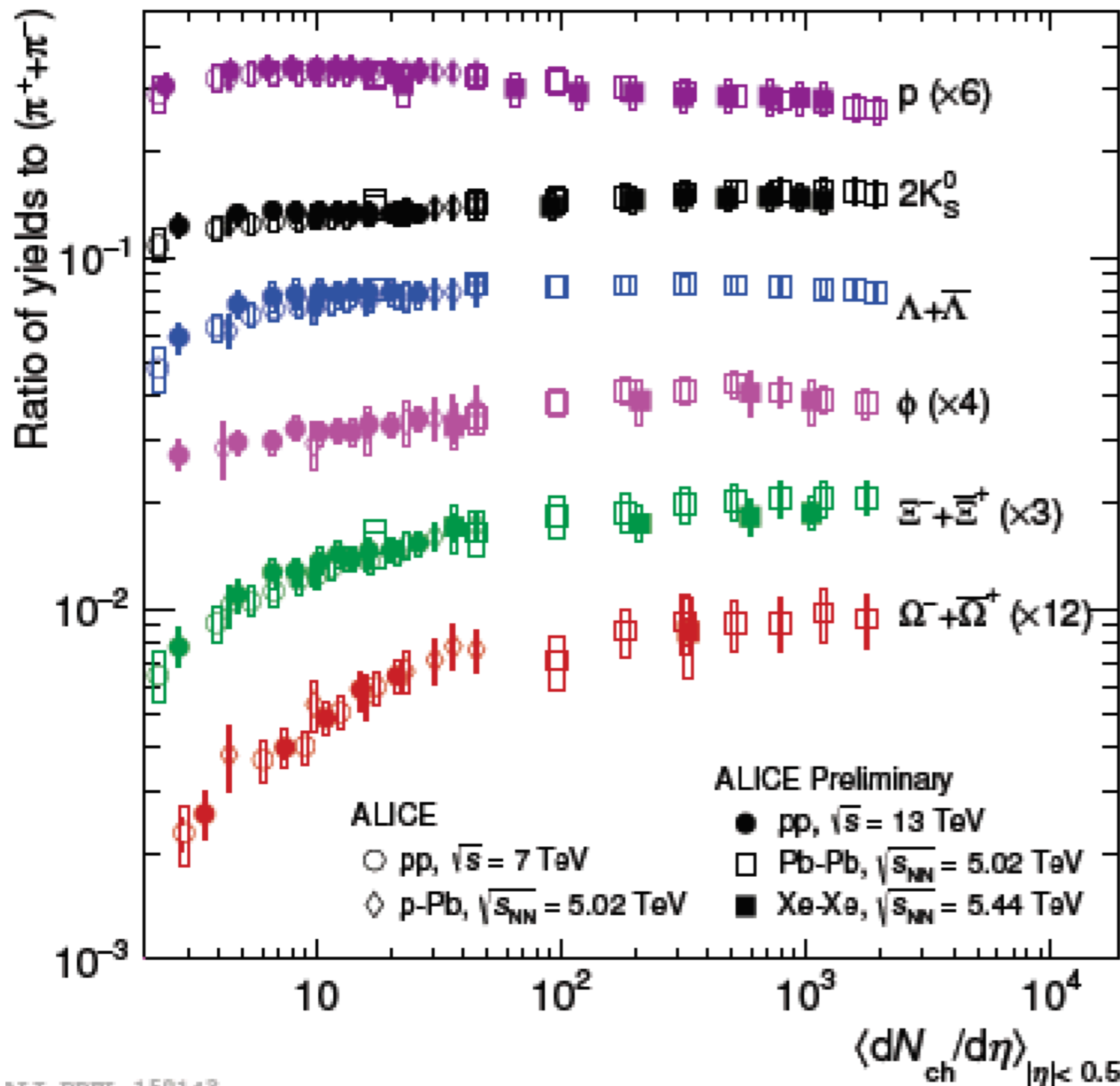
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ALICE RUN3



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RUN3

7 /cm²s

1 interactions) PbPb ~ 10 x RUN1&2

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/ c-bb ... at low pT

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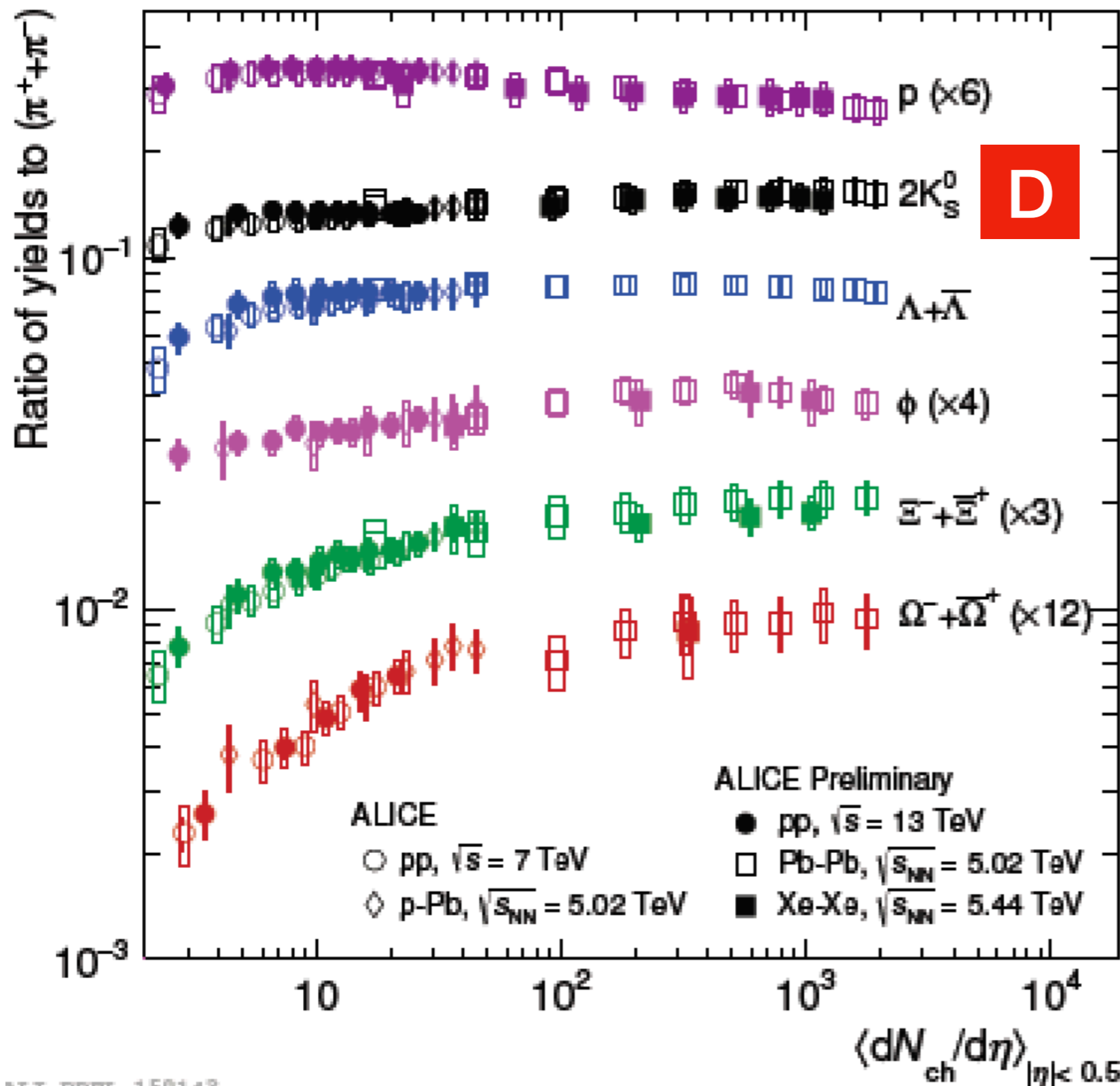
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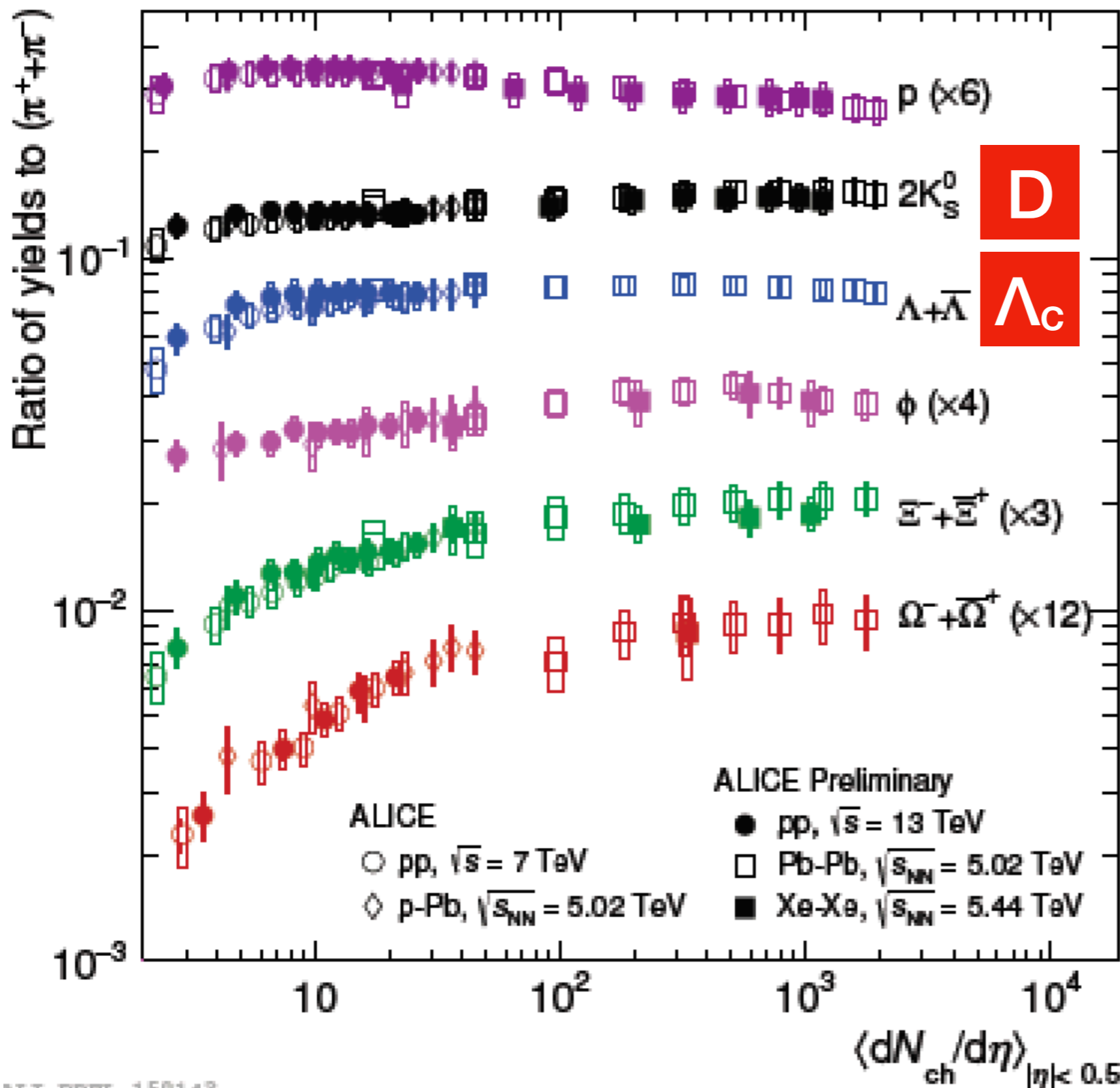
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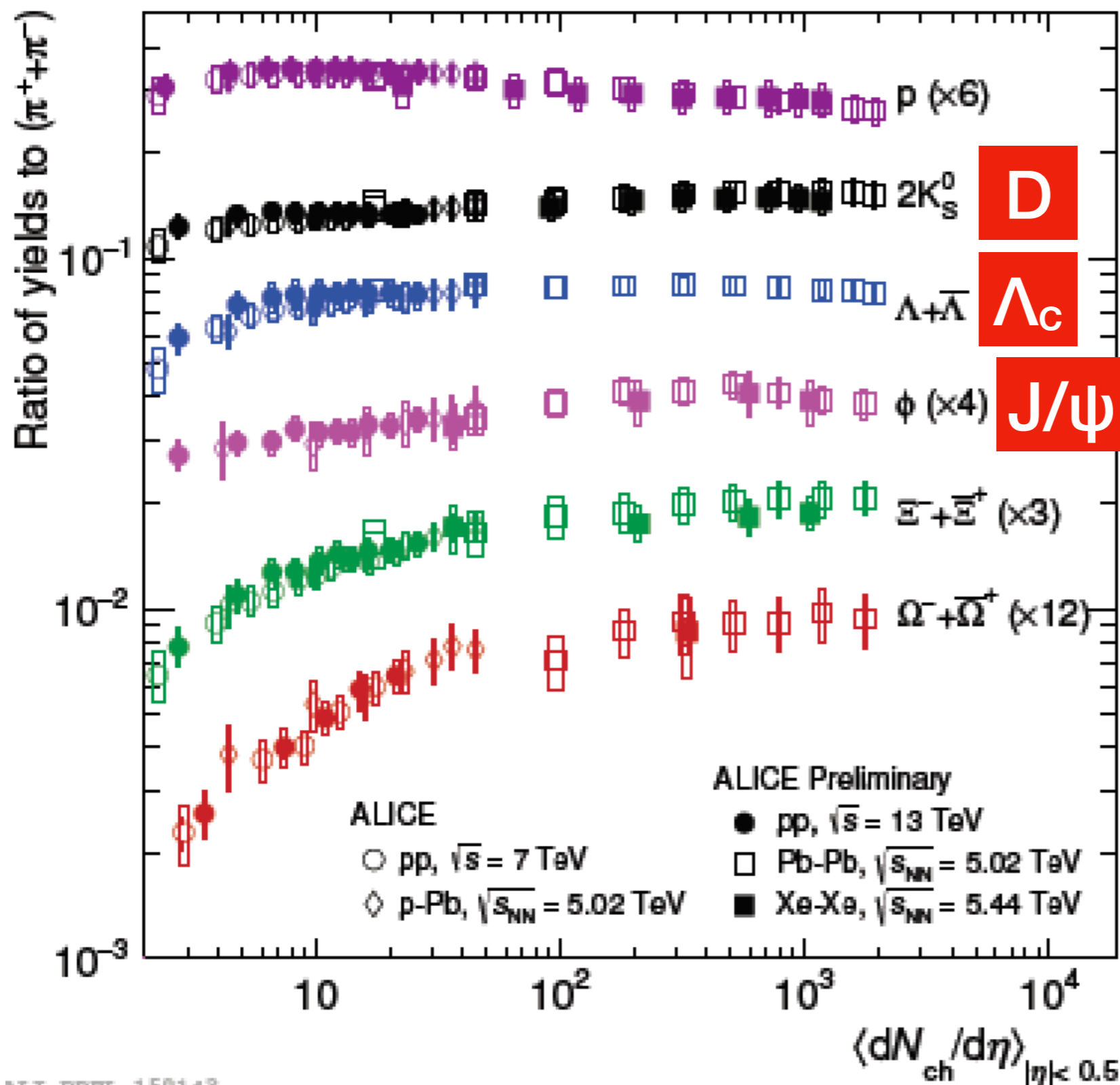
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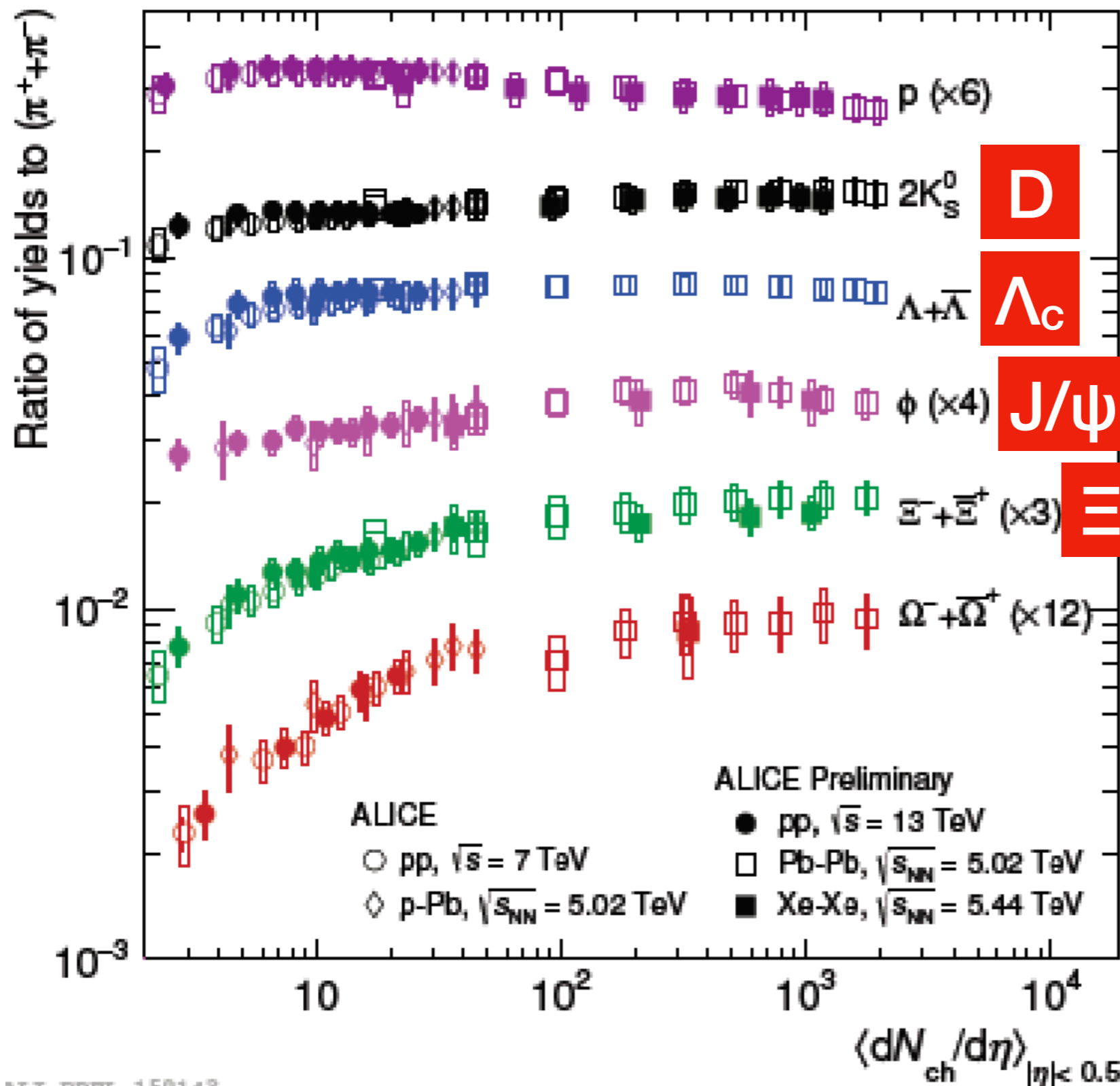
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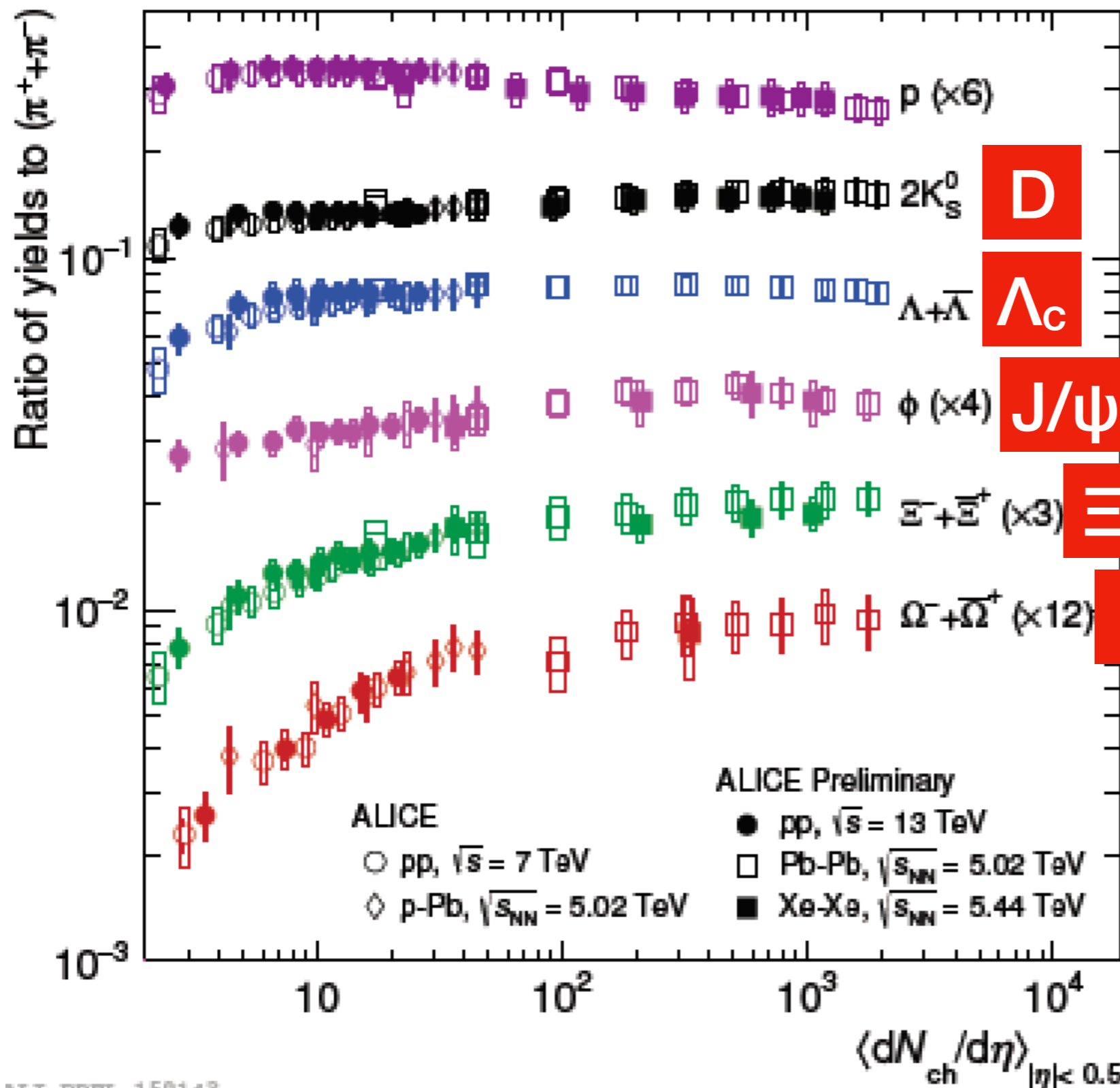
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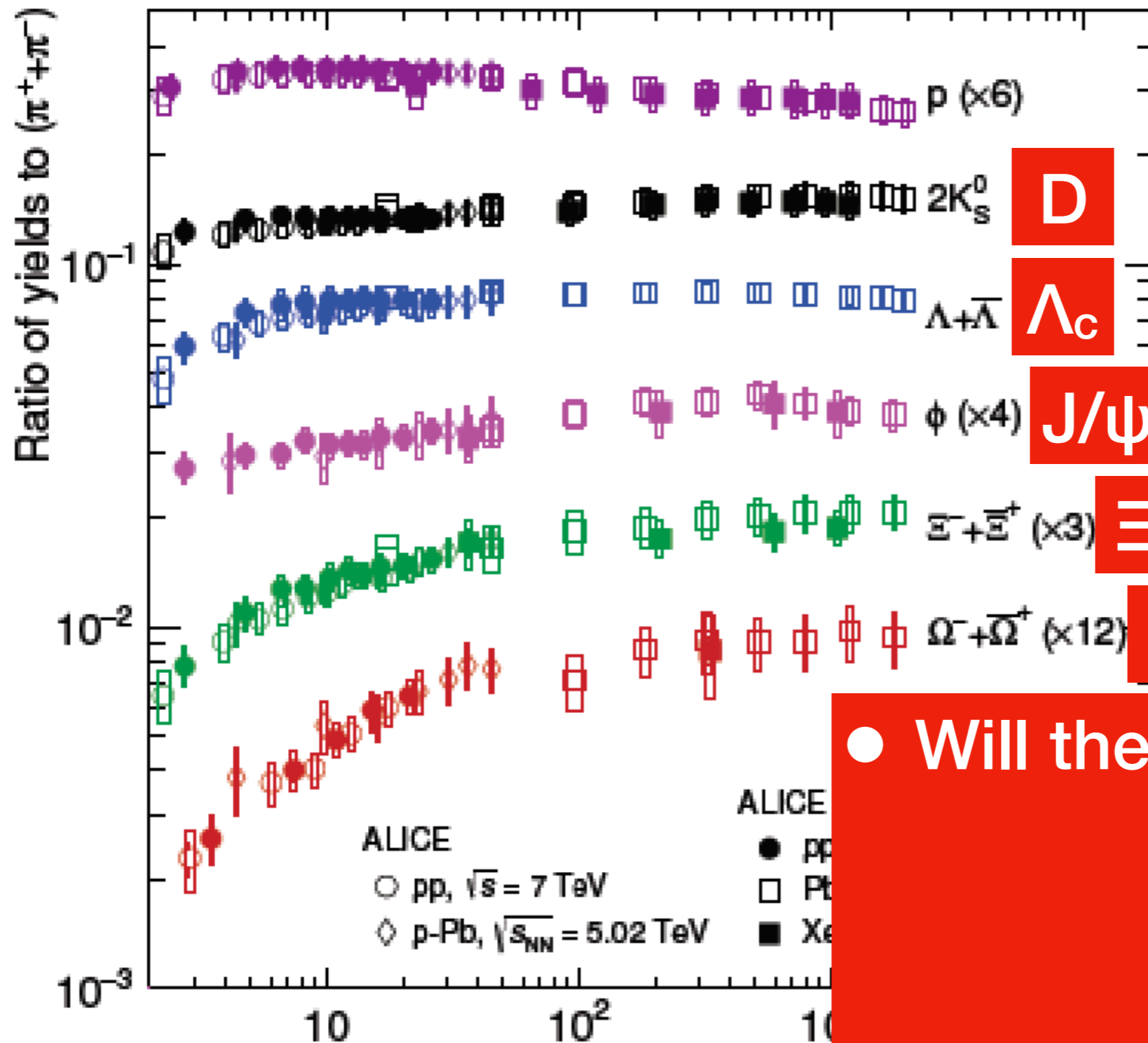
Ω_{ccc}

ALICE RUN3



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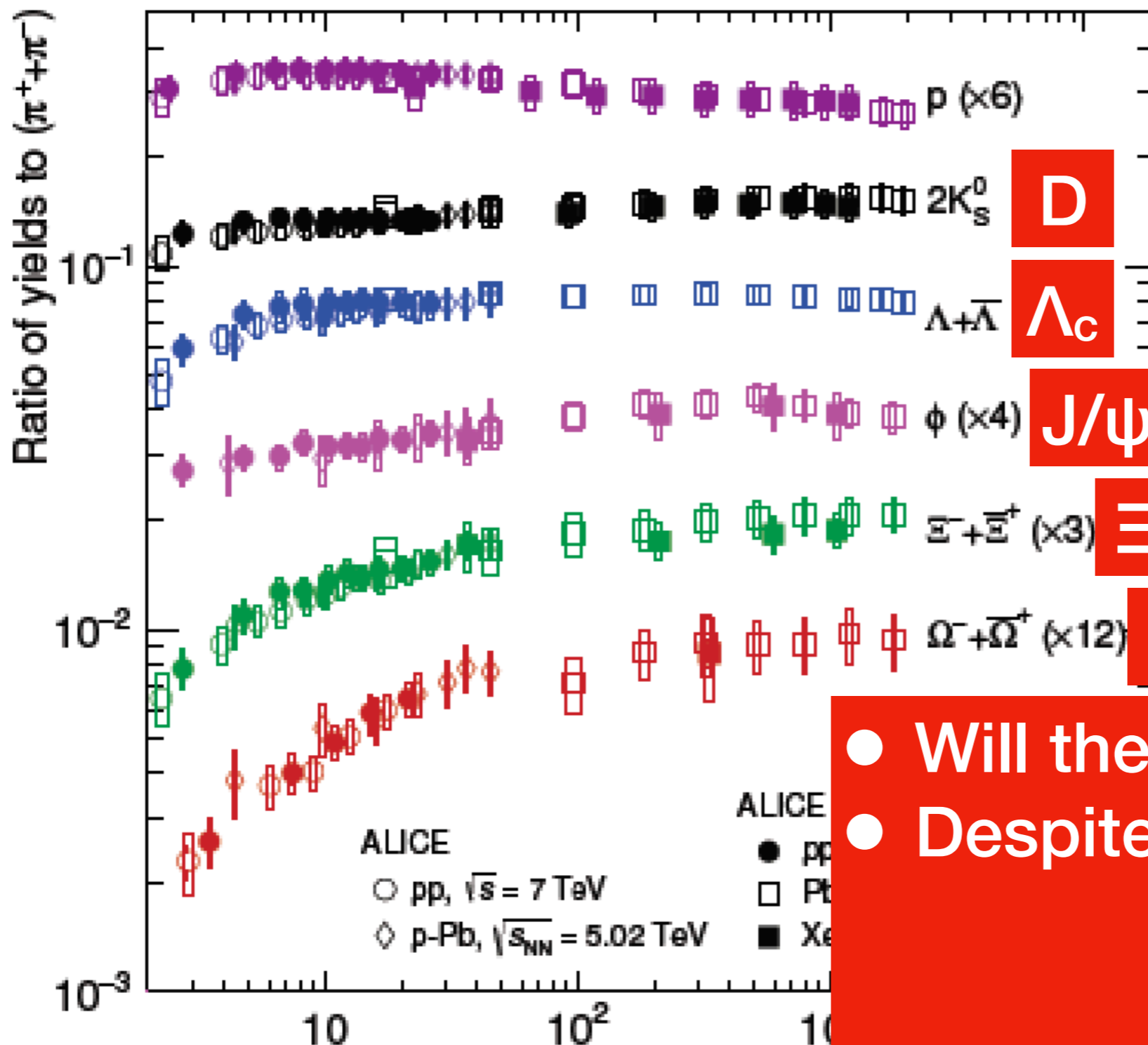
● Will they behave similar to s?

ALICE RUN3



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2022
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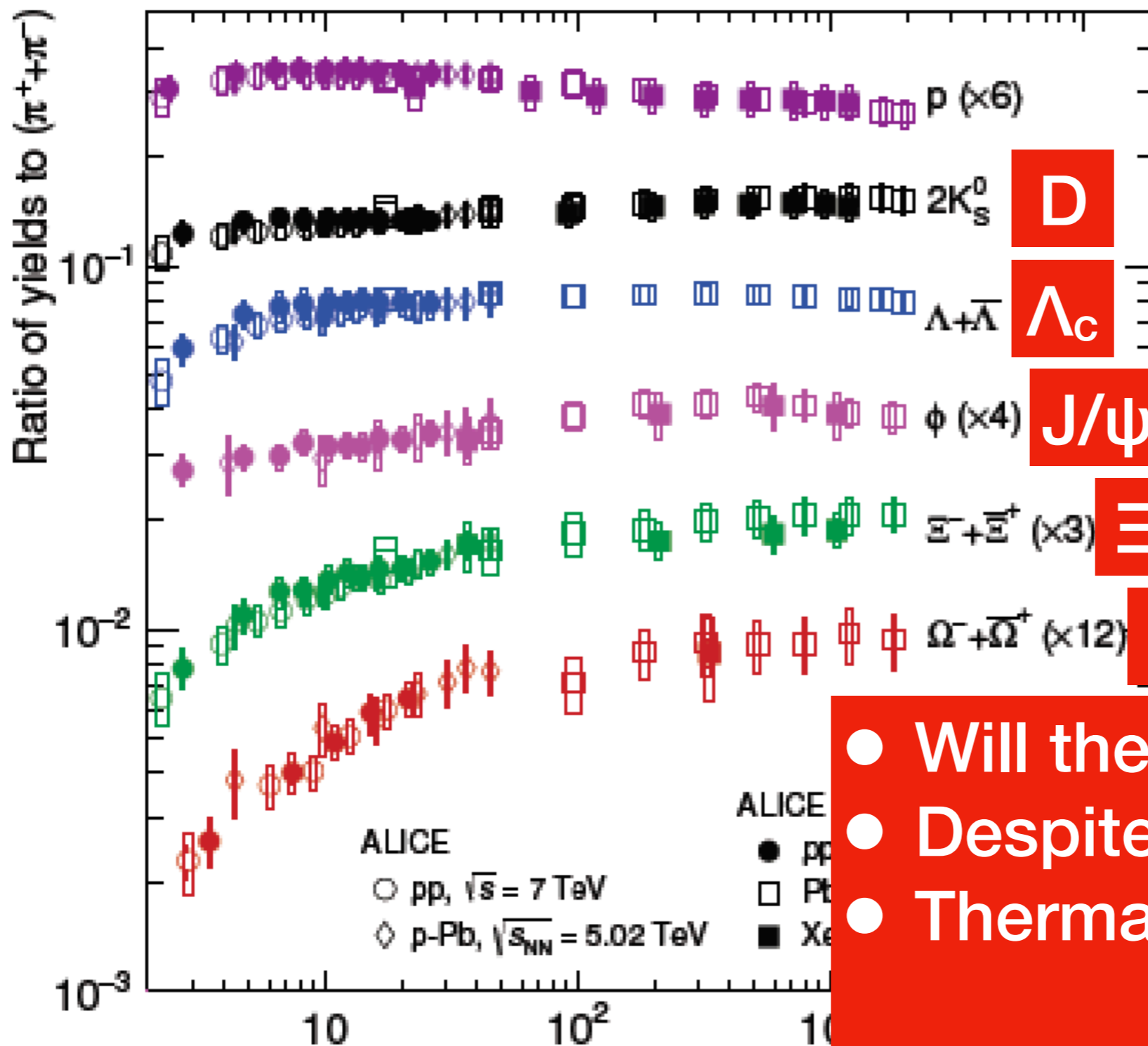
- Will they behave similar to s?
- Despite different birth-origin?

ALICE RUN3



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2022

2023

RUN3

$7 / \text{cm}^2\text{s}$

1 interactions) PbPb $\sim 10 \times$ RUN1&2

/ double-charmed / strange-cc /

/ c-bb ... at low p_T

al suppression? $dN/d\eta$ -scaling?

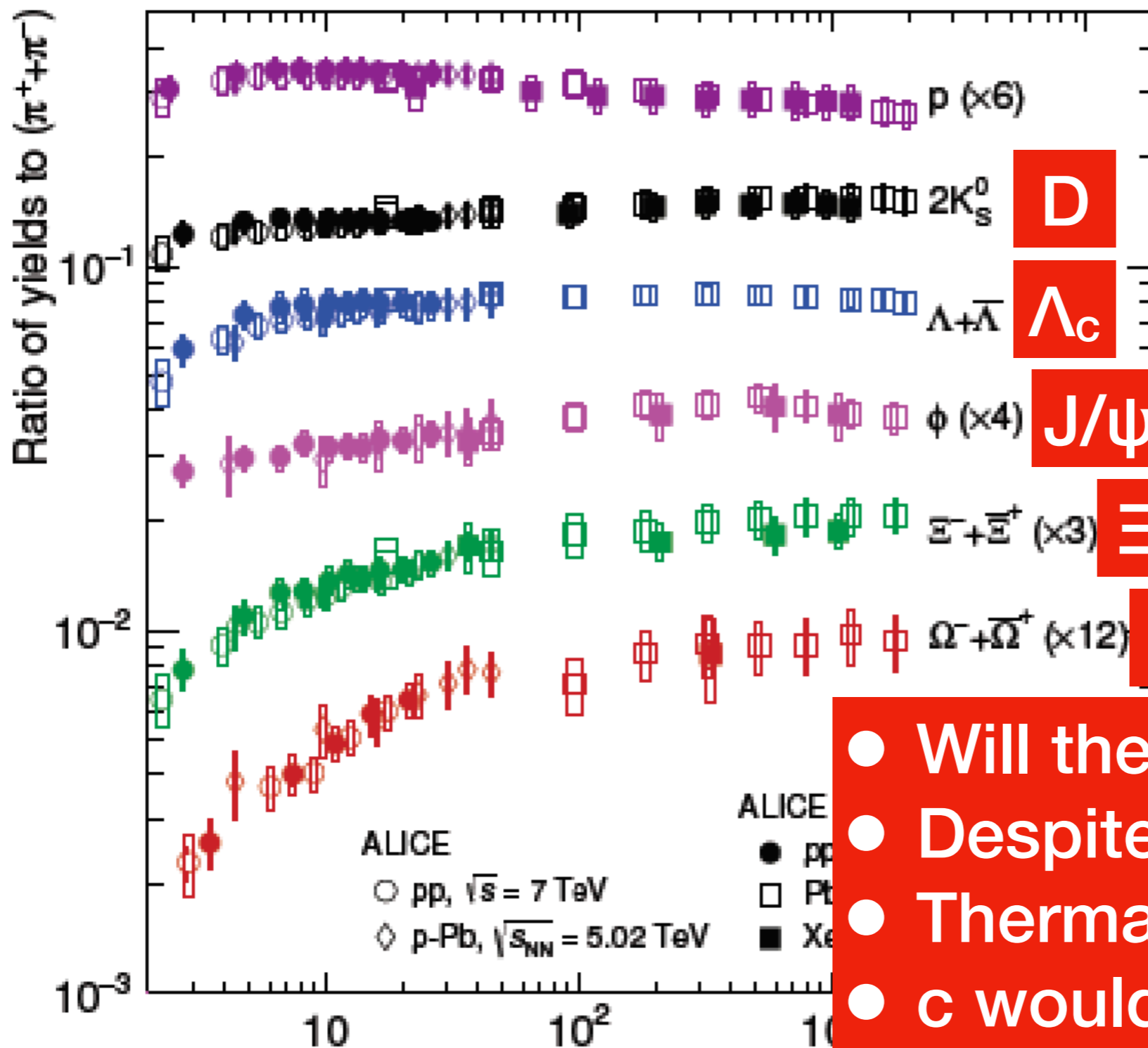
- Will they behave similar to s?
- Despite different birth-origin?
- Thermally produced c?

ALICE RUN3



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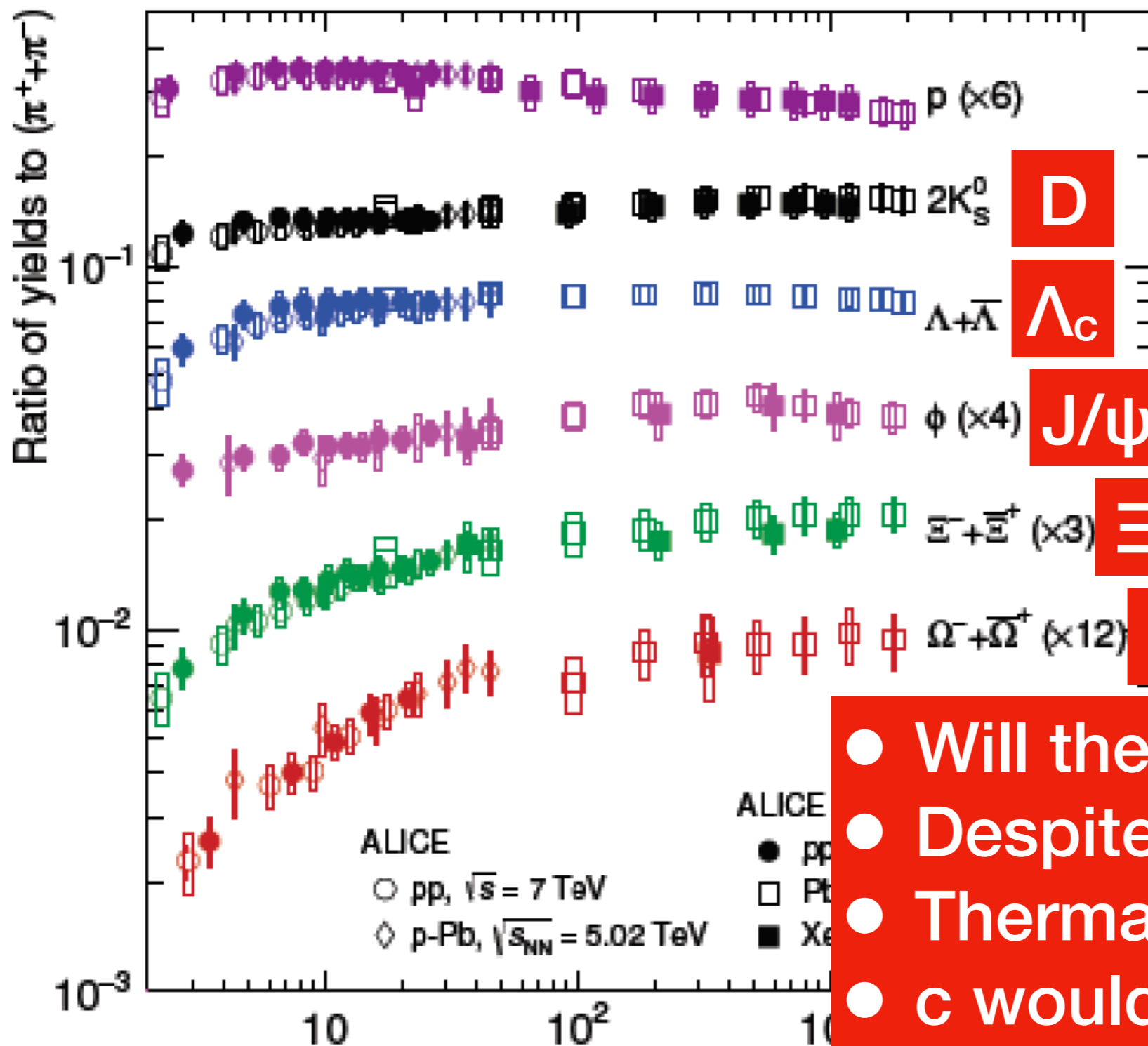
- Will they behave similar to s?
- Despite different birth-origin?
- Thermally produced c?
- c would be different from s!

ALICE RUN3



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2022

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al suppression? dN/dη-scaling?

- Will they behave similar to s?
- Despite different birth-origin?
- Thermally produced c?
- c would be different from s!
- Have to confirm!

ALITE in RUN4

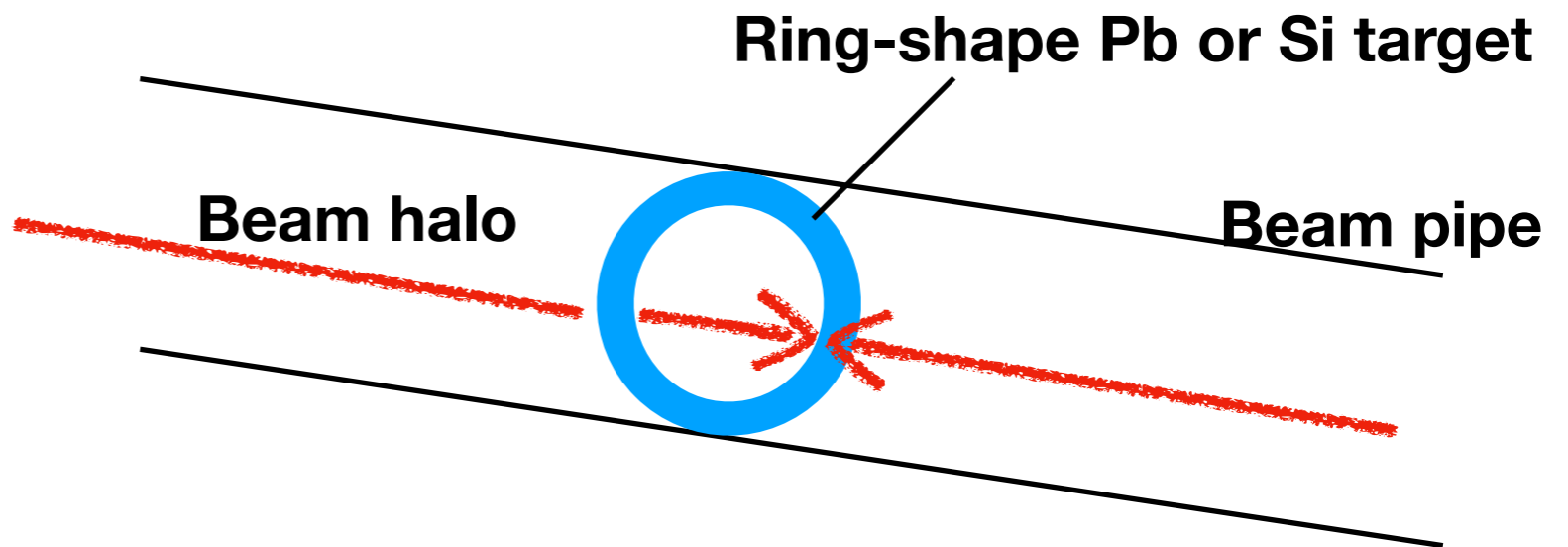


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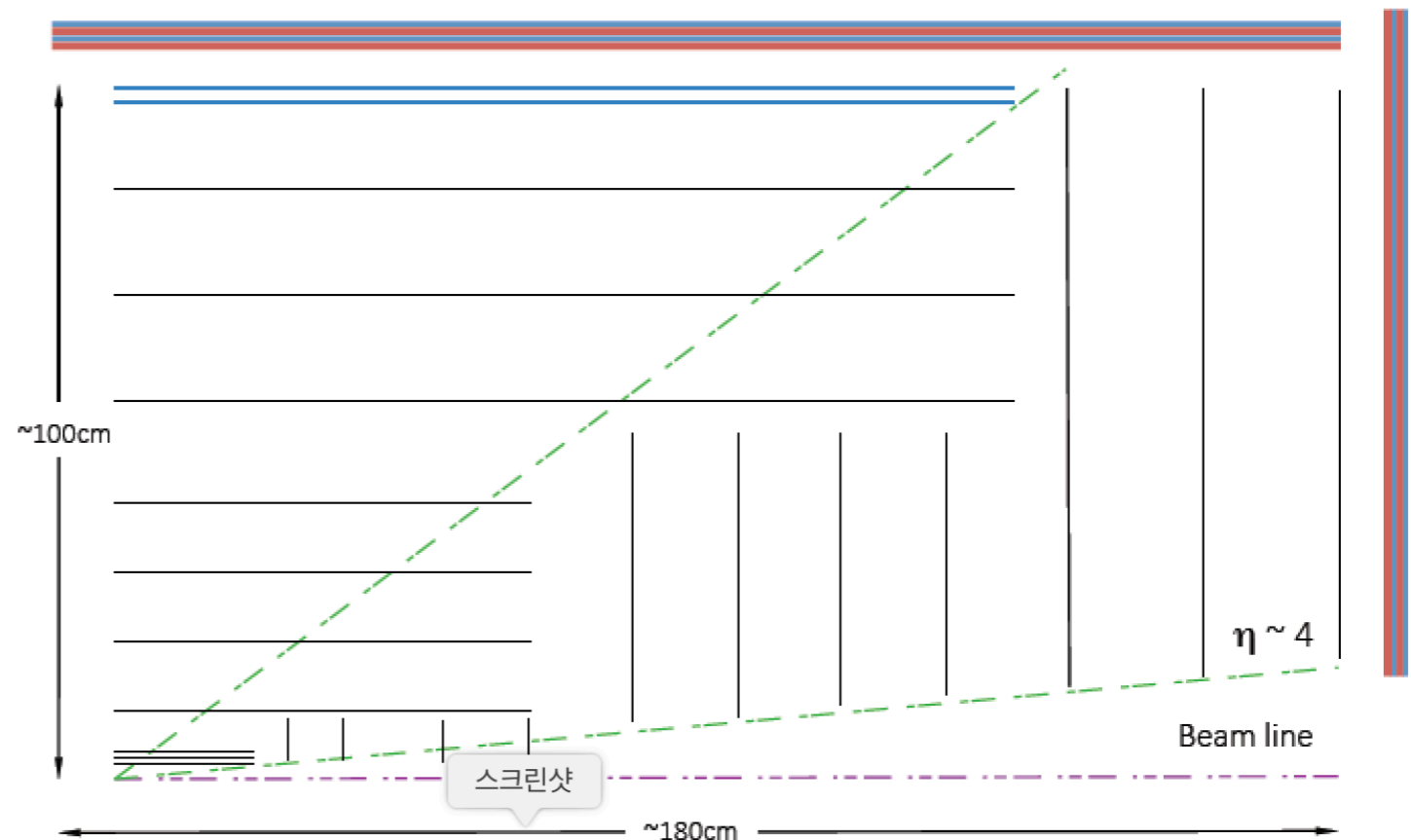
$\sqrt{s_{NN}} = 60 \text{ .. } 75 \text{ GeV}$



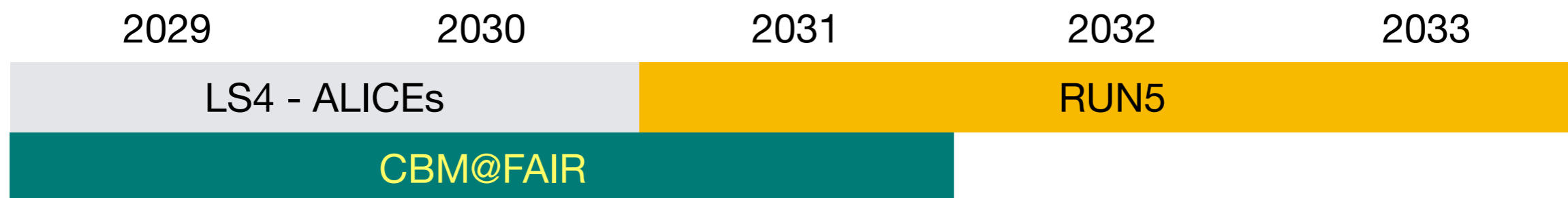
- **ALI Target Experiment**
 - A short period of Target (Test) Experiment (in RUN5-6 with ALICEs)
 - Higher Interaction rate at (little) lower $\sqrt{s_{NN}}$
 - Closer IP
 - Trillision (3 nuclei collision) event?
- Silicon R&D + Production for ALICEs in RUN5-6
 - ITS3 + 7 tracking barrel layers +
 - (Active Target Experiment at SPS)
- Exploring QCD diagram with Charm



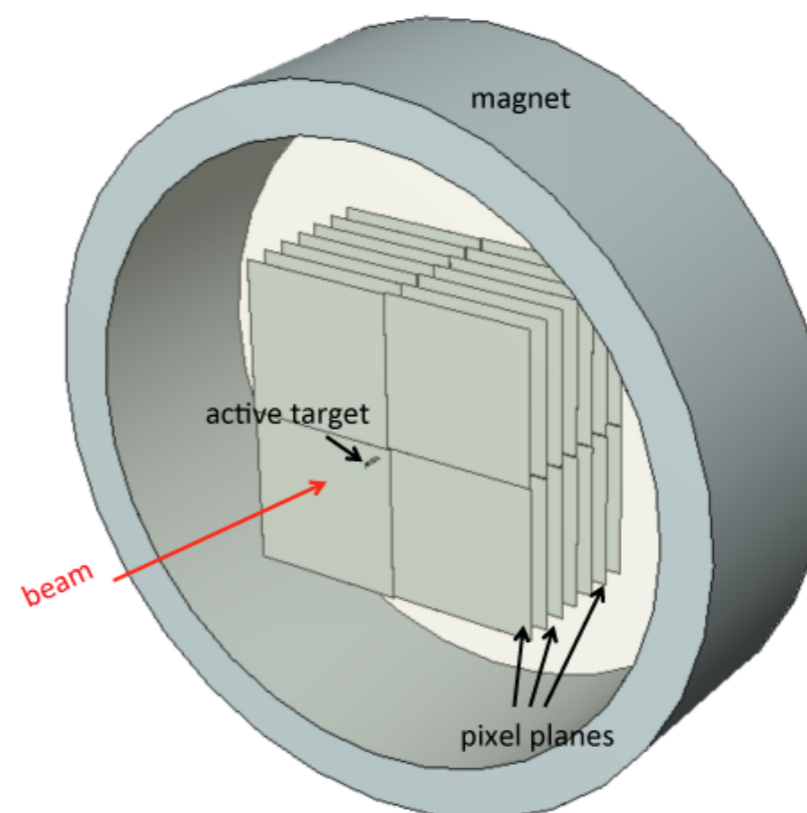
$\sqrt{s_{NN}} = 2.7 \text{ .. } 5.5 \text{ TeV}$



- ALICE w silicon (LMusa)
 - higher data taking rate w/o TPC
 - 10 tracking barrel layers + 7 end caps + LGAD barrel + Pre-shower
- Exploring QCD diagram with Charm



$\sqrt{s_{NN}} = 60 \text{ .. } 75 \text{ GeV}$



- ALI active Target Experiment (LMusa)
 - higher data taking rate w/o TPC
 - 10 tracking barrel layers + 7 end caps + LGAD barrel + Pre-shower
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Budget Outlook

KoALICE2030



- KoALICE Budget
 - The final cash payment (ITS MoU ~ 100kCHF/yr) ends 2019 → Ministry is aware on it.
 - M&O-B for ITS2 urgently needed.
 - Further NEW proposal (LoI..MoU) for ITS3 needed
 - 5-8th ('19-'21; '22-'24; '25-'27; '28-'30) 3Y Period since 2007
- Personal Budget: Application is currently open
 - 5Y (Mar. '19 - Feb. '24) or 9Y (Jun. '19 - May. '28)
 - ~ 400k - 800kUSD/yr incl. OH