



# Open Science in ALICE

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ALICE

# Open Data Policy

- Level 1 – Published results
  - All ALICE publications published Open Access
  - All ALICE publications release data tables in HEPdata
    - Plan to also release response matrices and/or correlations matrices
  - Ongoing effort to release RIVET routines
    - Now also Heavy-Ion option available

**ALICE\_2017\_I1645239**

$\Lambda_c^+$  production in pp collisions at  $\sqrt{s} = 7$  TeV and in p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV

Experiment: ALICE (LHC)  
 Inspire ID: 1645239  
 Status: VALIDATED  
 Authors: Marco Giacalone

References: DOI: 10.1007/JHEP04(2018)108, arXiv: 1712.09581

Beam energies: ANY  
 No run details listed

The  $p_T$ -differential production cross section of prompt  $\Lambda_c^+$  charmed baryons was measured with the ALICE detector at the Large Hadron Collider (LHC) in pp collisions at  $\sqrt{s} = 7$  TeV and in p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV at midrapidity. The  $\Lambda_c^+$  and  $\bar{\Lambda}_c^+$  were reconstructed in the hadronic decay modes  $\Lambda_c^+ \rightarrow pK^- \pi^+$ ,  $\Lambda_c^+ \rightarrow pK_S^0$  and in the semileptonic channel  $\Lambda_c^+ \rightarrow e^+ \nu_e \Lambda$  (and charge conjugates). The measured values of the  $\Lambda_c^+ / D^0$  ratio, which is sensitive to the c-quark hadronisation mechanism, and in particular to the production of baryons, are presented and are larger than those measured previously in different colliding systems, centre-of-mass energies, rapidity and  $p_T$  intervals, where the  $\Lambda_c^+$  production process may differ. The results are compared with the expectations obtained from perturbative Quantum Chromodynamics calculations and Monte Carlo event generators. Neither perturbative QCD calculations nor Monte Carlo models reproduce the data, indicating that the fragmentation of heavy-flavour baryons is not well understood. The first measurement at the LHC of the  $\Lambda_c^+$  nuclear modification factor,  $R_{pPb}$ , is also presented. The  $R_{pPb}$  is found to be consistent with unity and with that of D mesons within the uncertainties, and consistent with a theoretical calculation that includes cold nuclear matter effects and a calculation that includes charm quark interactions with a deconfined medium.

Source code: ALICE\_2017\_I1645239.cc

```

1 // -*- C++ -*-
2 #include "Rivet/Analysis.hh"
3 #include "Rivet/Projections/FastJets.hh"
4 #include "Rivet/Projections/FinalState.hh"
5 #include "Rivet/Projections/UnstableParticles.hh"
6
7 namespace Rivet {
8
9

```

HEPData

Search HEPData

Showing 10 of 293 results

Date

**First measurements of  $N$ -subjettiness in central Pb–Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV**

The ALICE collaboration Acharya, Shreyasi; Adamova, Dagmar; Adler, Alexander; et al.

CERN-EP-2021-082, 2021.

Inspire Record 1862792 DOI 10.17182/hepdata.111055

The ALICE Collaboration reports the first fully-corrected measurements of the  $N$ -subjettiness observable for track-based jets in heavy-ion collisions. This study is performed using data recorded in pp and Pb–Pb collisions at centre-of-mass energies of  $\sqrt{s} = 7$  TeV and  $\sqrt{s_{NN}} = 2.76$  TeV, respectively. In particular the ratio of 2-subjettiness to 1...

Collaboration: ALICE (293)

Subject\_areas: nucl-ex (269), hep-ex (256), nucl-th (4), Instrumentation (2), Phenomenology-HEP (1)

Phrases: Inclusive (80), Proton-Proton Scattering (46), Transverse Momentum Dependence (40), Single Differential Distribution (23), Rapidity Dependence (22)

**Energy dependence of  $\phi$  meson production at forward rapidity in pp collisions at the LHC**

The ALICE collaboration Acharya, Shreyasi; Adamova, Dagmar; Adler, Alexander; et al.

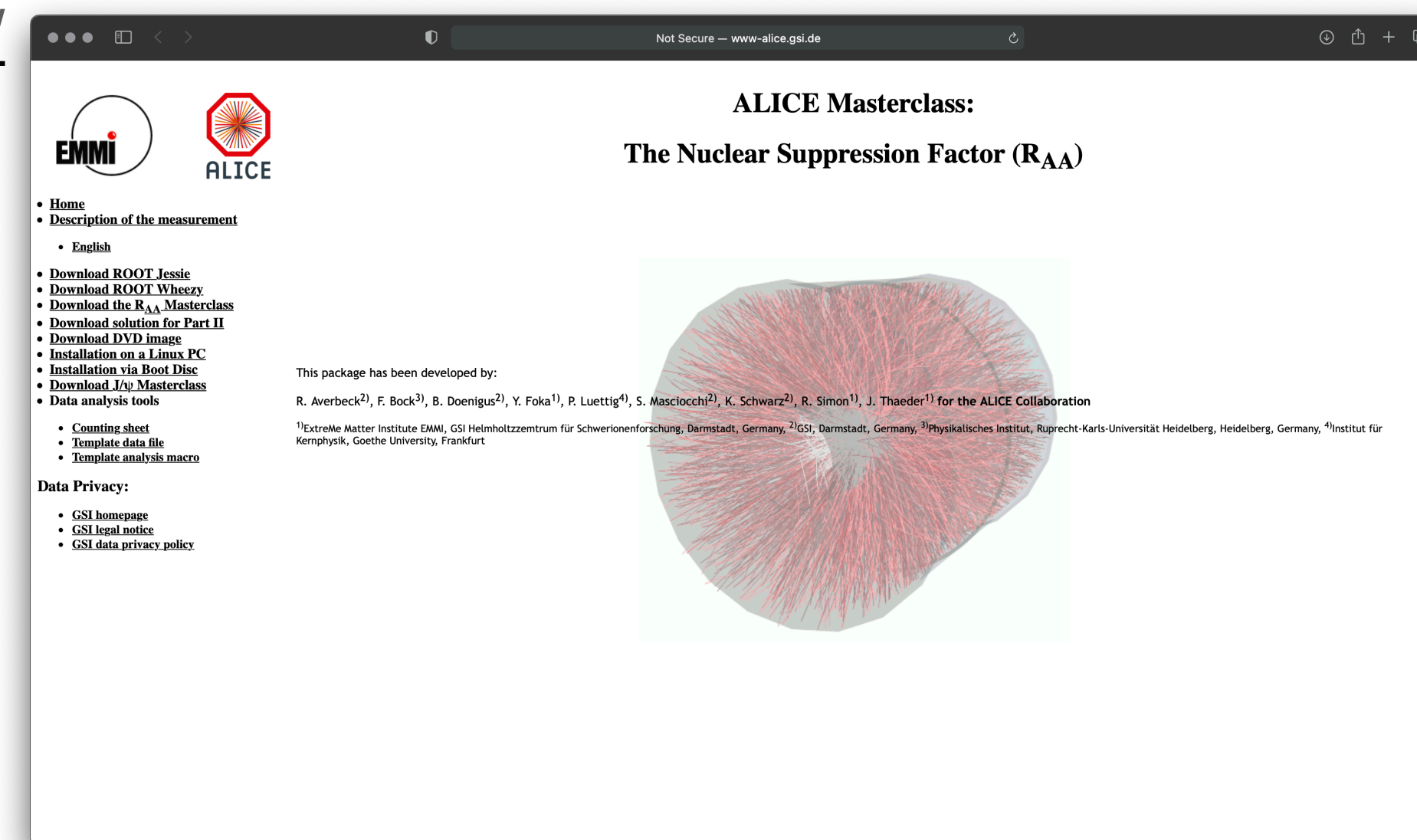
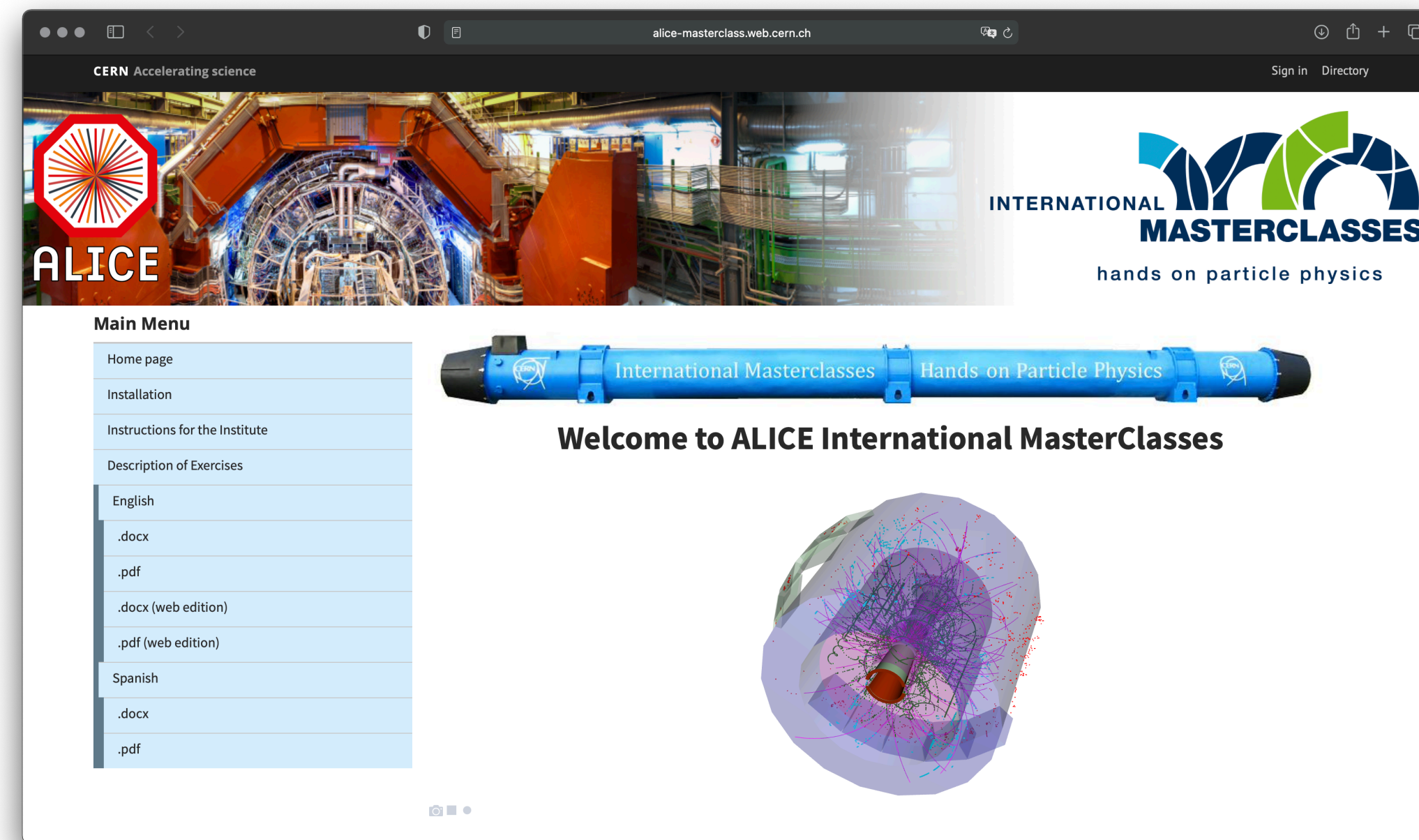
Eur.Phys.J.C 81 (2021) 772, 2021.



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- Level 2 – Outreach and Education
  - International Masterclasses – Hands on Particle Physics
  - Using samples of proton–proton and lead–lead data
    - strange particles <https://alice-masterclass.web.cern.ch>
    - the nuclear suppression factor RAA <http://www-alice.gsi.de/masterclass/>
- Level 3 – Reconstructed data
  - Policy adopted by the Collaboration Board on 12 Nov. 2020
- Level 4 – Raw data
  - Unviable





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# Open Data Policy – Level 3

- Current status

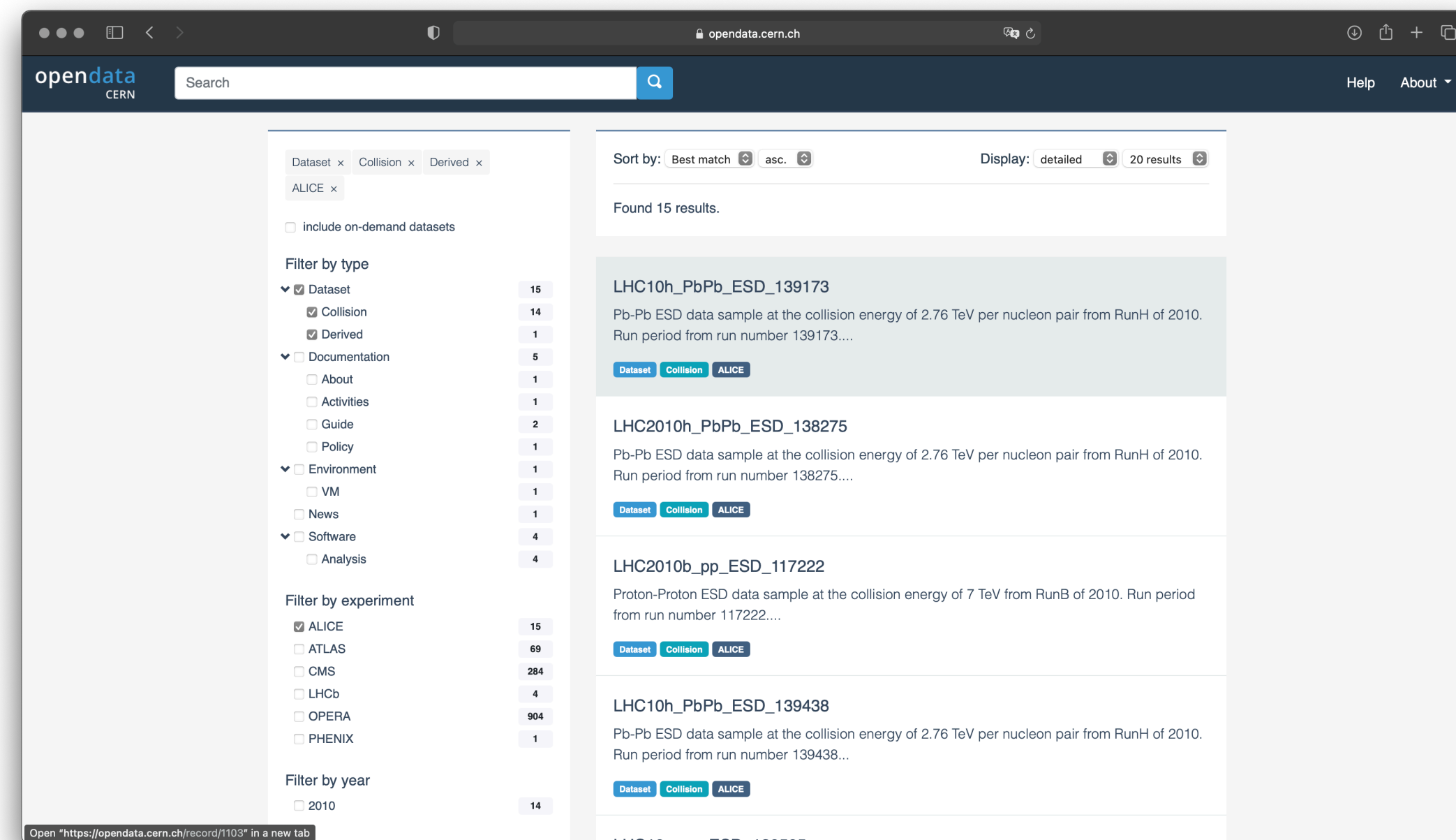
- CERN Open Data Portal
  - 5% (7%) of Pb–Pb (pp) 2010 ESD datasets
  - ALICE analysis demonstrator (both VM and container)

- Release plans

- 50% of Run 1 data by 2023
- 10% of Run 2 data by 2024 ↗ 50% Run 2 data by 2028
- 10% of Run 3 data from 2029

- Data format and software

- New AOD format based on Run 3 and 4 data format is being developed
- New software framework developed ALICE O2 project for Run 3 and 4
- Conversion of Run 1 and 2 data foreseen
  - Significant reduction of output size

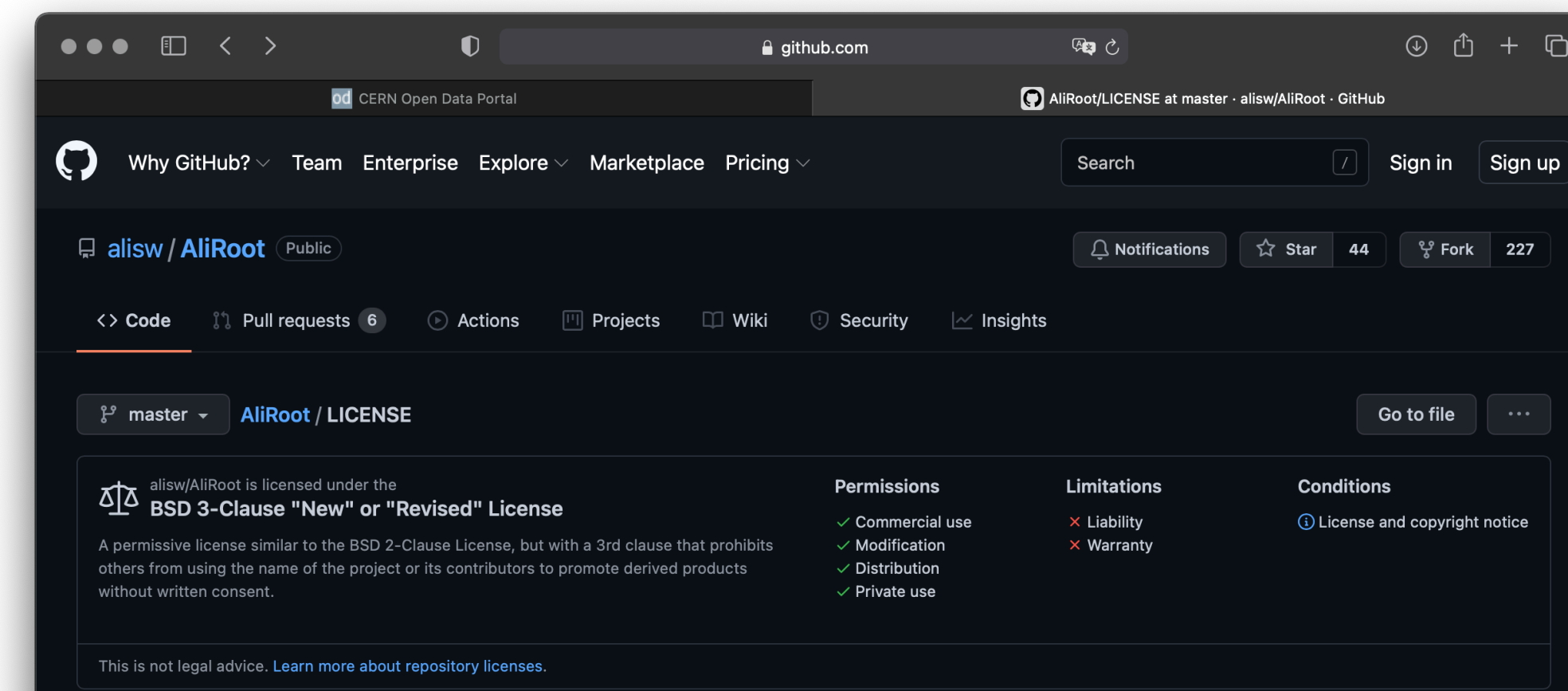




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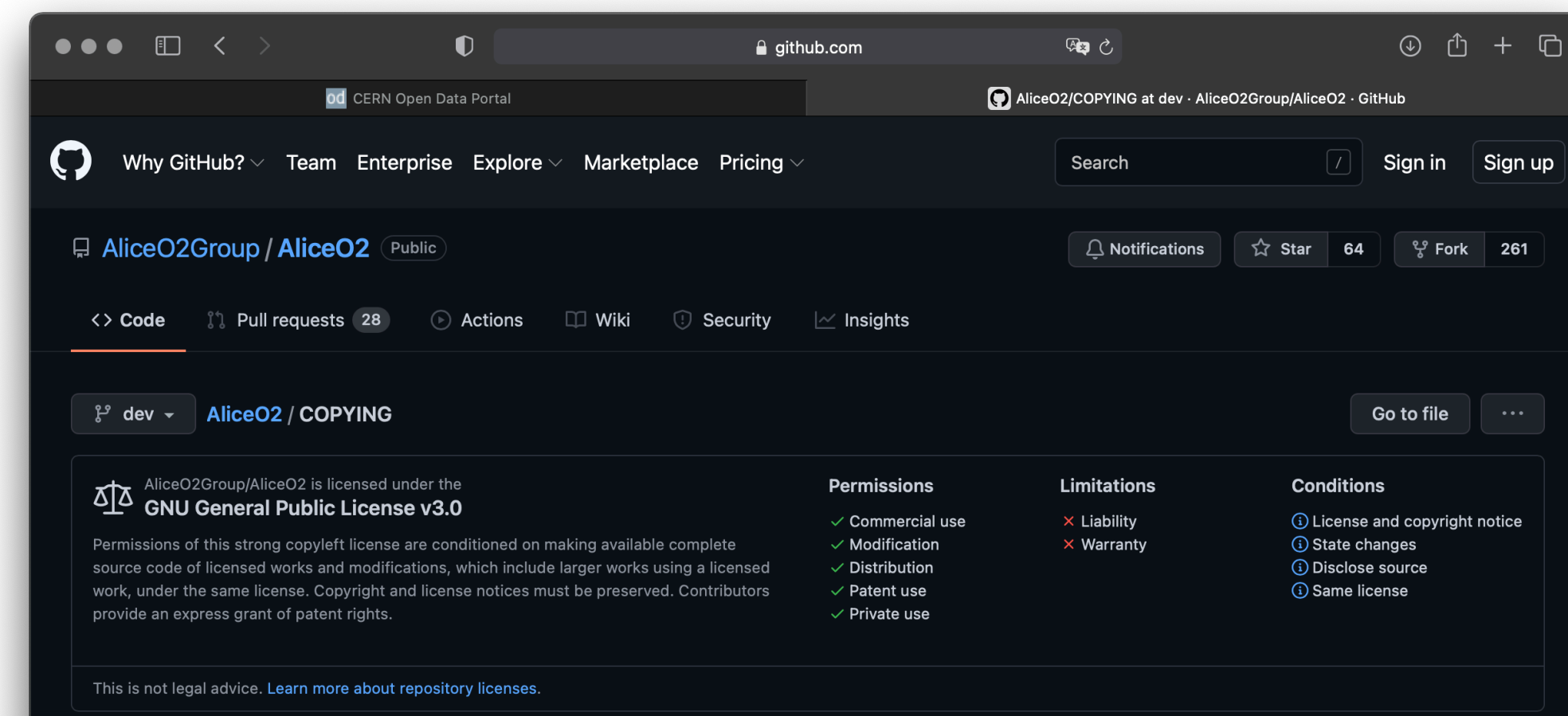
# Open Source Software

- Legacy Run 1 and Run 2 software: AliRoot, AliPhysics
  - Distributed under BSD 3-Clause “New” or “Revised” License
  - Available in GitHub <https://github.com/alisw/AliRoot>
  - And <https://github.com/alisw/AliPhysics>
    - Including analysis tasks of published results



- New Run 3 and Run 4 software: AliceO2

- Distributed under GNU General Public License v3.0
- Available in GitHub <https://github.com/AliceO2Group/AliceO2>
- Except some components with non-open source licenses, which are available in GitLab with restricted access.



- Collaborative work

- on software with other facilities/experiments (FAIR/CBM) but also companies



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# Thank You!



Javier Castillo Castellanos



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