

Presentazione del dott. Stefano Trogolo
Dottorato di Ricerca in Fisica - XXX Ciclo
Università degli Studi di Torino

Dottorando: Stefano Trogolo

Relatore: Elena Botta

Titolo della tesi:

Study of the production of (anti-)hypertriton at the LHC with the ALICE experiment

Durante il triennio di dottorato il dott. Stefano Trogolo ha seguito e sostenuto l'esame relativo ai seguenti corsi della Scuola:

- Astrophysical signals of particle dark matter
- Hands-on Fitting and Statistical Tools for Data Analysis
- Data Analysis Techniques
- Introduction to the Physics of the Quark-Gluon Plasma

L'attività di ricerca del dott. Stefano Trogolo ha riguardato lo studio della produzione di sistemi nucleari contenenti stranezza, detti ipernuclei, e dei corrispondenti partner di antimateria nelle collisioni tra ioni pesanti ultrarelativistici alle energie di LHC. In particolare, ha investigato la produzione di ipertrizio e anti-ipertrizio.

Al momento dell'inizio della attività di dottorato del dott. Trogolo, la linea di ricerca non era ancora consolidata. Il dott. Trogolo ha dovuto, pertanto, sviluppare sostanzialmente dal principio la tecnica di analisi ed ottimizzare gli algoritmi per la selezione del segnale, la reiezione del fondo e la valutazione degli effetti dovuti all'apparato, trattati attraverso simulazioni Monte Carlo. Questi aspetti vengono brevemente delineati nel seguito. Il segnale utilizzato per identificare la produzione dell'ipertrizio è il suo decadimento; sono stati considerati i canali con due corpi nello stato finale, ${}^3_{\Lambda}\text{H} \rightarrow \pi^- + {}^3\text{He}$, e con tre corpi ${}^3_{\Lambda}\text{H} \rightarrow \pi^- + d + p$ ed i canali coniugati per il partner di antimateria $\overline{{}^3_{\Lambda}\text{H}}$. Il risultato finale atteso è la determinazione del rate di produzione di (anti-)ipertrizio nelle collisioni Pb-Pb a diverse energie di collisione e la misura della vita media del sistema. Il rate di produzione viene ottenuto contando gli (anti-)ipertrizi identificati, distinguendo, ove la statistica del campione lo consenta, diversi intervalli di impulso trasverso, di rapidità e di centralità di collisione. La vita media viene, invece, determinata considerando la legge di scala del numero di decadimenti identificati al variare della distanza dal vertice primario della collisione.

Il primo passo delle analisi condotte è stato scegliere le opportune selezioni per identificare le particelle prodotte nei due diversi canali di decadimento e ricostruire i candidati vertici secondari. Successivamente sono state valutate le efficienze usate per correggere i limiti dell'esperimento ALICE nella ricostruzione e nell'accettanza di ${}^3_{\Lambda}\text{H}$ e $\overline{{}^3_{\Lambda}\text{H}}$. Per fare questo è stato necessario fare delle simulazioni Monte Carlo di cui il dott. Trogolo si è preso cura fin dalla fase di preparazione definendo le configurazioni necessarie e controllandone i risultati. Per la misura della vita media sono state seguite due tecniche di analisi che permettessero di ottenere due risultati indipendenti, così da poter verificare se la misura della vita media fosse

coerente. La ragione di questa doppia tecnica è legata al fatto che questa misura è molto discussa all'interno della fisica degli ioni pesanti; d'altro canto, il valore della vita media dell'ipertrizio è anche uno dei punti aperti di interesse per la fisica degli ipernuclei e anche in questo ambito vi è necessità di misure il più possibile precise .

Durante la sua attività di ricerca il dott. Stefano Trogolo ha mostrato una crescente capacità critica nell'affrontare le varie fasi del suo lavoro, dimostrando di aver raggiunto una notevole indipendenza. Il lavoro è stato svolto nell'ambito di uno dei Physics Analysis Groups della Collaborazione ALICE, dedicato allo studio della produzione di nuclei e sistemi esotici nelle collisioni Pb-Pb a LHC. I coordinatori di questo PAG hanno apprezzato pienamente la puntualità e la precisione delle azioni del dott. Trogolo. A dimostrazione della maturità raggiunta, nell'ultimo anno di dottorato, il dott. Trogolo è anche stato scelto come coordinatore delle attività di Quality Assurance del Physics Working Group on Light Flavours di ALICE che coordina diversi PAG, tra i quali quello dei nuclei e sistemi esotici.

Pertanto si esprime grande apprezzamento per il lavoro svolto dal Dott. Stefano Trogolo durante il triennio del Dottorato di Ricerca.

Torino, 22 settembre 2017

Il tutore

A handwritten signature in black ink, appearing to read "Elena Botta". The signature is written in a cursive, flowing style.

Partecipazione a scuole e conferenze

- ALICE Physics week, CERN, 24-28 novembre 2014 (internal ALICE workshop)
- INFN ITS-upgrade, LNF - Frascati, 5-6 marzo 2015 (internal ALICE workshop)
- Anti-matter, hyper-matter and exotica production at the LHC, CERN, 20-22 luglio 2015
- Quark Matter 2015, Kobe, Japan, 27 settembre - 3 ottobre 2015
- ALICE Mini Week, CERN, 19-23 gennaio 2015
- ALICE Week, CERN, 10-13 marzo 2015
- ALICE Mini Week, CERN, 18-22 maggio 2015
- XXV Giornate di Studio sui Rivelatori - Scuola F.Bonaudi, Cogne, 23-26 Febbraio 2016
- International School of Subnuclear Physics 2016, Erice, 14-23 giugno 2016, talk Premiato con il diploma "Guido Altarelli"
- INFN Workshop on Future Detectors, Torino, 16-18 dicembre 2015
- ALICE Mini Week, CERN, 25-29 gennaio 2016
- INFN-What Next, Roma, 16-17 febbraio 2016
- INFN ITS-upgrade, LNF - Torino, 22-23 marzo 2016 (internal ALICE workshop)
- 125th LHCC Meeting - Open Session, CERN, 2-3 marzo 2016, poster
- IFAE 2016, Genova, 30 marzo - 1 aprile 2016, poster
- HOT QUARKS 2016, SOUTH PADRE ISLAND, Texas (USA), 12-17 settembre 2016, talk Winner "Klaus-Kinder Geiger Award" for the Best Conference Talk
- 102° Congresso S.I.F. (Società Italiana di Fisica), Padova, 23-30 settembre 2016, talk
- Practical Statistics for Particle Physics Analyses, CERN, 28 novembre - 1 dicembre 2016
- QUARK MATTER 2017, CHICAGO, USA, 5 - 11 gennaio 2017, poster
- ALICE Mini Week, CERN, 3 - 7 aprile 2017
- ALICE Mini Week, CERN, 1 - 5 maggio 2017
- ALICE Mini Week, CERN, 29 maggio - 2 giugno 2017
- European Physical Society - High Energy Physics Conference (EPS-HEP), Venezia, 5 - 12 luglio 2017, talk
- ALICE Mini Week, CERN, 25 - 29 settembre 2017

- Secondo incontro sulla fisica con ioni pesanti a LHC, Torino, 9-10 ottobre 2017
- ALICE Mini Week, CERN, 16 - 20 ottobre 2017

Elenco delle pubblicazioni

- **“ J/ψ elliptic flow in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1709.05260 [nucl-ex]
CERN-EP-2017-237
- **“Constraining the magnitude of the Chiral Magnetic Effect with Event Shape Engineering in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1709.04723 [nucl-ex]
CERN-EP-2017-241
- **“The ALICE Transition Radiation Detector: construction, operation, and performance”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1709.02743 [physics.ins-det]
CERN-EP-2017-222
- **“Kaon femtoscopy in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1709.01731 [nucl-ex]
CERN-EP-2017-185
- **“Systematic studies of correlations between different order flow harmonics in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1709.01127 [nucl-ex]
CERN-EP-2017-215
- **“ π^0 and η meson production in proton-proton collisions at $\sqrt{s} = 8$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1708.08745 [hep-ex]
CERN-EP-2017-216
- **“Measurement of deuteron spectra and elliptic flow in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV at the LHC”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1707.07304 [nucl-ex]
CERN-EP-2017-176
- **“Searches for transverse momentum dependent flow vector fluctuations in Pb-Pb and p-Pb collisions at the LHC”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1707.05690 [nucl-ex]

DOI:10.1007/JHEP09(2017)032
JHEP **1709**, 032 (2017)
CERN-EP-2017-149

- **“D-meson azimuthal anisotropy in mid-central Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1707.01005 [nucl-ex]
CERN-EP-2017-153
- **“Measuring $K_S^0 K^\pm$ interactions using Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1705.04929 [nucl-ex]
CERN-EP-2017-063
- **“Linear and non-linear flow modes in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
S. Acharya *et al.* [ALICE Collaboration].
arXiv:1705.04377 [nucl-ex]
DOI:10.1016/j.physletb.2017.07.060
Phys. Lett. B **773**, 68 (2017)
CERN-EP-2017-103
- **“(Hyper-)nuclei and exotica production measured with ALICE at the LHC”**
S. Trogolo [ALICE Collaboration].
DOI:10.1088/1742-6596/832/1/012061
J. Phys. Conf. Ser. **832**, no. 1, 012061 (2017).
- **“J/ ψ production as a function of charged-particle pseudorapidity density in p-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV”**
D. Adamova *et al.* [ALICE Collaboration].
arXiv:1704.00274 [nucl-ex]
CERN-EP-2017-056
- **“Flow dominance and factorization of transverse momentum correlations in Pb-Pb collisions at the LHC”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1702.02665 [nucl-ex]
DOI:10.1103/PhysRevLett.118.162302
Phys. Rev. Lett. **118**, no. 16, 162302 (2017)
CERN-EP-2017-021
- **“Azimuthally differential pion femtoscopy in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
D. Adamova *et al.* [ALICE Collaboration].
arXiv:1702.01612 [nucl-ex]
DOI:10.1103/PhysRevLett.118.222301
Phys. Rev. Lett. **118**, no. 22, 222301 (2017)
CERN-EP-2017-013

- **“Production of muons from heavy-flavour hadron decays in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
 S. Acharya *et al.* [ALICE Collaboration].
 arXiv:1702.01479 [nucl-ex]
 DOI:10.1016/j.physletb.2017.03.049
 Phys. Lett. B **770**, 459 (2017)
 CERN-EP-2017-022
- **“Production of π^0 and η mesons up to high transverse momentum in pp collisions at 2.76 TeV”**
 S. Acharya *et al.* [ALICE Collaboration].
 arXiv:1702.00917 [hep-ex]
 DOI:10.1140/epjc/s10052-017-5144-7, 10.1140/epjc/s10052-017-4890-x
 Eur. Phys. J. C **77**, no. 5, 339 (2017), Erratum: [Eur. Phys. J. C **77**, no. 9, 586 (2017)]
 CERN-EP-2017-019
- **“First measurement of jet mass in Pb-Pb and p-Pb collisions at the LHC”**
 S. Acharya *et al.* [ALICE Collaboration].
 arXiv:1702.00804 [nucl-ex]
 CERN-EP-2017-016
- **“Measurement of D-meson production at mid-rapidity in pp collisions at $\sqrt{s} = 7$ TeV”**
 S. Acharya *et al.* [ALICE Collaboration].
 arXiv:1702.00766 [hep-ex]
 DOI:10.1140/epjc/s10052-017-5090-4
 Eur. Phys. J. C **77**, no. 8, 550 (2017)
 CERN-EP-2017-020
- **“Energy dependence of forward-rapidity J/ψ and $\psi(2S)$ production in pp collisions at the LHC”**
 S. Acharya *et al.* [ALICE Collaboration].
 arXiv:1702.00557 [hep-ex]
 DOI:10.1140/epjc/s10052-017-4940-4
 Eur. Phys. J. C **77**, no. 6, 392 (2017)
 CERN-EP-2017-015
- **“ $K^*(892)^0$ and $\phi(1020)$ meson production at high transverse momentum in pp and Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1702.00555 [nucl-ex]
 DOI:10.1103/PhysRevC.95.064606
 Phys. Rev. C **95**, no. 6, 064606 (2017)
 CERN-EP-2017-010
- **“Production of $\Sigma(1385)^\pm$ and $\Xi(1530)^0$ in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
 D. Adamova *et al.* [ALICE Collaboration].
 arXiv:1701.07797 [nucl-ex]
 DOI:10.1140/epjc/s10052-017-4943-1

Eur. Phys. J. C **77**, no. 6, 389 (2017)
CERN-EP-2017-017

- **“Insight into particle production mechanisms via angular correlations of identified particles in pp collisions at $\sqrt{s} = 7$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1612.08975 [nucl-ex]
DOI:10.1140/epjc/s10052-017-5129-6
Eur. Phys. J. C **77**, no. 8, 569 (2017)
CERN-EP-2016-322
- **“Centrality dependence of the pseudorapidity density distribution for charged particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1612.08966 [nucl-ex]
DOI:10.1016/j.physletb.2017.07.017
Phys. Lett. B **772**, 567 (2017)
CERN-EP-2016-327
- **“W and Z boson production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1611.03002 [nucl-ex]
DOI:10.1007/JHEP02(2017)077
JHEP **1702**, 077 (2017)
CERN-EP-2016-278
- **“Determination of the event collision time with the ALICE detector at the LHC”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1610.03055 [physics.ins-det]
DOI:10.1140/epjp/i2017-11279-1
Eur. Phys. J. Plus **132**, no. 2, 99 (2017)
CERN-EP-2016-253
- **“Measurement of the production of high- p_T electrons from heavy-flavour hadron decays in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1609.07104 [nucl-ex]
DOI:10.1016/j.physletb.2017.05.060
Phys. Lett. B **771**, 467 (2017)
CERN-EP-2016-235
- **“Evolution of the longitudinal and azimuthal structure of the near-side jet peak in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1609.06667 [nucl-ex]
DOI:10.1103/PhysRevC.96.034904
Phys. Rev. C **96**, no. 3, 034904 (2017)
CERN-EP-2016-228

- **“Anomalous evolution of the near-side jet peak shape in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1609.06643 [nucl-ex]
 DOI:10.1103/PhysRevLett.119.102301
 Phys. Rev. Lett. **119**, no. 10, 102301 (2017)
 CERN-EP-2016-229
- **“Measurement of electrons from beauty-hadron decays in p-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV and Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1609.03898 [nucl-ex]
 DOI:10.1007/JHEP07(2017)052
 JHEP **1707**, 052 (2017)
 CERN-EP-2016-222
- **“Jet-like correlations with neutral pion triggers in pp and central Pb-Pb collisions at 2.76 TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1608.07201 [nucl-ex]
 DOI:10.1016/j.physletb.2016.10.048
 Phys. Lett. B **763**, 238 (2016)
 CERN-EP-2016-195
- **“ J/ψ suppression at forward rapidity in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1606.08197 [nucl-ex]
 DOI:10.1016/j.physletb.2016.12.064
 Phys. Lett. B **766**, 212 (2017)
 CERN-EP-2016-162
- **“Enhanced production of multi-strange hadrons in high-multiplicity proton-proton collisions”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1606.07424 [nucl-ex]
 DOI:10.1038/nphys4111
 Nature Phys. **13**, 535 (2017)
 CERN-EP-2016-153
- **“Higher harmonic flow coefficients of identified hadrons in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1606.06057 [nucl-ex]
 DOI:10.1007/JHEP09(2016)164
 JHEP **1609**, 164 (2016)
 CERN-EP-2016-159
- **“Elliptic flow of electrons from heavy-flavour hadron decays at mid-rapidity in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**

J. Adam *et al.* [ALICE Collaboration].
arXiv:1606.00321 [nucl-ex]
DOI:10.1007/JHEP09(2016)028
JHEP **1609**, 028 (2016)
CERN-EP-2016-136

- **“D-meson production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV and in pp collisions at $\sqrt{s} = 7$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1605.07569 [nucl-ex]
DOI:10.1103/PhysRevC.94.054908
Phys. Rev. C **94**, no. 5, 054908 (2016)
CERN-EP-2016-127
- **“Measurement of azimuthal correlations of D mesons and charged particles in pp collisions at $\sqrt{s} = 7$ TeV and p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1605.06963 [nucl-ex]
DOI:10.1140/epjc/s10052-017-4779-8
Eur. Phys. J. C **77**, no. 4, 245 (2017)
CERN-EP-2016-129
- **“Pseudorapidity dependence of the anisotropic flow of charged particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1605.02035 [nucl-ex]
DOI:10.1016/j.physletb.2016.07.017
Phys. Lett. B **762**, 376 (2016)
CERN-EP-2016-115
- **“Correlated event-by-event fluctuations of flow harmonics in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1604.07663 [nucl-ex]
DOI:10.1103/PhysRevLett.117.182301
Phys. Rev. Lett. **117**, 182301 (2016)
CERN-EP-2016-102
- **“Measurement of transverse energy at midrapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1603.04775 [nucl-ex]
DOI:10.1103/PhysRevC.94.034903
Phys. Rev. C **94**, no. 3, 034903 (2016)
CERN-EP-2016-071
- **“Centrality dependence of charged jet production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].

arXiv:1603.03402 [nucl-ex]
DOI:10.1140/epjc/s10052-016-4107-8
Eur. Phys. J. C **76**, no. 5, 271 (2016)
CERN-EP-2016-052, ALICE-PUBLIC-2016-001

- **“Centrality dependence of $\psi(2S)$ suppression in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1603.02816 [nucl-ex]
DOI:10.1007/JHEP06(2016)050
JHEP **1606**, 050 (2016)
CERN-EP-2016-046
- **“Measurement of D-meson production versus multiplicity in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1602.07240 [nucl-ex]
DOI:10.1007/JHEP08(2016)078
JHEP **1608**, 078 (2016)
CERN-EP-2016-034
- **“Particle identification in ALICE: a Bayesian approach”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1602.01392 [physics.data-an]
DOI:10.1140/epjp/i2016-16168-5
Eur. Phys. J. Plus **131**, no. 5, 168 (2016)
CERN-EP-2016-023
- **“Anisotropic flow of charged particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1602.01119 [nucl-ex]
DOI:10.1103/PhysRevLett.116.132302
Phys. Rev. Lett. **116**, no. 13, 132302 (2016)
CERN-EP-2016-018
- **“Production of $K^* (892)^0$ and $\phi (1020)$ in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1601.07868 [nucl-ex]
DOI:10.1140/epjc/s10052-016-4088-7
Eur. Phys. J. C **76**, no. 5, 245 (2016)
CERN-PH-EP-2015-326
- **“Multiplicity dependence of charged pion, kaon, and (anti)proton production at large transverse momentum in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1601.03658 [nucl-ex]
DOI:10.1016/j.physletb.2016.07.050

Phys. Lett. B **760**, 720 (2016)
CERN-EP-2016-003

- **“Multipion Bose-Einstein correlations in pp,p -Pb, and Pb-Pb collisions at energies available at the CERN Large Hadron Collider”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1512.08902 [nucl-ex]
DOI:10.1103/PhysRevC.93.054908
Phys. Rev. C **93**, no. 5, 054908 (2016)
CERN-PH-EP-2015-330, ALICE-PUBLIC-2015-009
- **“Multi-strange baryon production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1512.07227 [nucl-ex]
DOI:10.1016/j.physletb.2016.05.027
Phys. Lett. B **758**, 389 (2016)
CERN-PH-EP-2015-327
- **“Centrality dependence of the charged-particle multiplicity density at midrapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1512.06104 [nucl-ex]
DOI:10.1103/PhysRevLett.116.222302
Phys. Rev. Lett. **116**, no. 22, 222302 (2016)
CERN-PH-EP-2015-324, ALICE-PUBLIC-2015-008
- **“Charge-dependent flow and the search for the chiral magnetic wave in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1512.05739 [nucl-ex]
DOI:10.1103/PhysRevC.93.044903
Phys. Rev. C **93**, no. 4, 044903 (2016)
CERN-PH-EP-2015-316
- **“Measurement of an excess in the yield of J/ψ at very low p_T in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1509.08802 [nucl-ex]
DOI:10.1103/PhysRevLett.116.222301
Phys. Rev. Lett. **116**, no. 22, 222301 (2016)
CERN-PH-EP-2015-268
- **“Pseudorapidity and transverse-momentum distributions of charged particles in proton-proton collisions at $\sqrt{s} = 13$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1509.08734 [nucl-ex]
DOI:10.1016/j.physletb.2015.12.030
Phys. Lett. B **753**, 319 (2016)
CERN-PH-EP-2015-270, ALICE-PUBLIC-2015-005

- **“Inclusive quarkonium production at forward rapidity in pp collisions at $\sqrt{s} = 8$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.08258 [hep-ex]
 DOI:10.1140/epjc/s10052-016-3987-y
 Eur. Phys. J. C **76**, no. 4, 184 (2016)
 CERN-PH-EP-2015-267
- **“Charged-particle multiplicities in proton-proton collisions at $\sqrt{s} = 0.9$ to 8 TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.07541 [nucl-ex]
 DOI:10.1140/epjc/s10052-016-4571-1
 Eur. Phys. J. C **77**, no. 1, 33 (2017)
 CERN-PH-EP-2015-259
- **“Measurement of electrons from heavy-flavour hadron decays in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.07491 [nucl-ex]
 DOI:10.1016/j.physletb.2015.12.067
 Phys. Lett. B **754**, 81 (2016)
 CERN-PH-EP-2015-262
- **“Azimuthal anisotropy of charged jet production in $\sqrt{s_{NN}} = 2.76$ TeV Pb-Pb collisions”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.07334 [nucl-ex]
 DOI:10.1016/j.physletb.2015.12.047
 Phys. Lett. B **753**, 511 (2016)
 CERN-PH-EP-2015-258
- **“Direct photon production in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.07324 [nucl-ex]
 DOI:10.1016/j.physletb.2016.01.020
 Phys. Lett. B **754**, 235 (2016)
 CERN-PH-EP-2015-254, ALICE-PUBLIC-2015-007
- **“Centrality evolution of the charged-particle pseudorapidity density over a broad pseudorapidity range in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1509.07299 [nucl-ex]
 DOI:10.1016/j.physletb.2015.12.082
 Phys. Lett. B **754**, 373 (2016)
 CERN-PH-EP-2015-257, ALICE-PUBLIC-2015-010
- **“Measurement of D_s^+ production and nuclear modification factor in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**

J. Adam *et al.* [ALICE Collaboration].
arXiv:1509.07287 [nucl-ex]
DOI:10.1007/JHEP03(2016)082
JHEP **1603**, 082 (2016)
CERN-PH-EP-2015-253

- **“Multiplicity and transverse momentum evolution of charge-dependent correlations in pp, p-Pb, and Pb-Pb collisions at the LHC”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1509.07255 [nucl-ex]
DOI:10.1140/epjc/s10052-016-3915-1
Eur. Phys. J. C **76**, no. 2, 86 (2016)
CERN-PH-EP-2015-263
- **“Transverse momentum dependence of D-meson production in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1509.06888 [nucl-ex]
DOI:10.1007/JHEP03(2016)081
JHEP **1603**, 081 (2016)
CERN-PH-EP-2015-252
- **“Coherent $\psi(2S)$ photo-production in ultra-peripheral Pb Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1508.05076 [nucl-ex]
DOI:10.1016/j.physletb.2015.10.040
Phys. Lett. B **751**, 358 (2015)
CERN-PH-EP-2015-156
- **“Precision measurement of the mass difference between light nuclei and anti-nuclei”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1508.03986 [nucl-ex]
DOI:10.1038/nphys3432
Nature Phys. **11**, no. 10, 811 (2015)
CERN-PH-EP-2015-035, ALICE-PUBLIC-2015-002
- **“Study of cosmic ray events with high muon multiplicity using the ALICE detector at the CERN Large Hadron Collider”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1507.07577 [astro-ph.HE]
DOI:10.1088/1475-7516/2016/01/032
JCAP **1601**, no. 01, 032 (2016)
CERN-PH-EP-2015-196, ALICE-PUBLIC-2016-003
- **“Centrality dependence of pion freeze-out radii in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].

arXiv:1507.06842 [nucl-ex]
DOI:10.1103/PhysRevC.93.024905
Phys. Rev. C **93**, no. 2, 024905 (2016)
CERN-PH-EP-2015-140

- **“Event shape engineering for inclusive spectra and elliptic flow in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1507.06194 [nucl-ex]
DOI:10.1103/PhysRevC.93.034916
Phys. Rev. C **93**, no. 3, 034916 (2016)
CERN-PH-EP-2015-171
- **“Elliptic flow of muons from heavy-flavour hadron decays at forward rapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1507.03134 [nucl-ex]
DOI:10.1016/j.physletb.2015.11.059
Phys. Lett. B **753**, 41 (2016)
CERN-PH-EP-2015-173
- **“Production of light nuclei and anti-nuclei in pp and Pb-Pb collisions at energies available at the CERN Large Hadron Collider”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.08951 [nucl-ex]
DOI:10.1103/PhysRevC.93.024917
Phys. Rev. C **93**, no. 2, 024917 (2016)
CERN-PH-EP-2015-025
- **“ ϕ -meson production at forward rapidity in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV and in pp collisions at $\sqrt{s} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.09206 [nucl-ex]
DOI:10.1016/j.physletb.2017.01.074
Phys. Lett. B **768**, 203 (2017)
CERN-PH-EP-2015-161, ALICE-PUBLIC-2016-004
- **“Centrality dependence of inclusive J/ψ production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.08808 [nucl-ex]
DOI:10.1007/JHEP11(2015)127
JHEP **1511**, 127 (2015)
CERN-PH-EP-2015-158
- **“Differential studies of inclusive J/ψ and $\psi(2S)$ production at forward rapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.08804 [nucl-ex]

DOI:10.1007/JHEP05(2016)179
JHEP **1605**, 179 (2016)
CERN-PH-EP-2015-157

- **“ ${}^3_{\Lambda}\text{H}$ and ${}^3_{\Lambda}\bar{\text{H}}$ production in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.08453 [nucl-ex]
DOI:10.1016/j.physletb.2016.01.040
Phys. Lett. B **754**, 360 (2016)
CERN-PH-EP-2015-105
- **“Forward-central two-particle correlations in p-Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.08032 [nucl-ex]
DOI:10.1016/j.physletb.2015.12.010
Phys. Lett. B **753**, 126 (2016)
CERN-PH-EP-2015-155
- **“One-dimensional pion, kaon, and proton femtoscopy in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.07884 [nucl-ex]
DOI:10.1103/PhysRevC.92.054908
Phys. Rev. C **92**, no. 5, 054908 (2015)
CERN-PH-EP-2015-106
- **“Search for weakly decaying $\bar{\Lambda}\text{n}$ and $\Lambda\Lambda$ exotic bound states in central Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.07499 [nucl-ex]
DOI:10.1016/j.physletb.2015.11.048
Phys. Lett. B **752**, 267 (2016)
CERN-PH-EP-2015-069
- **“Centrality dependence of the nuclear modification factor of charged pions, kaons, and protons in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.07287 [nucl-ex]
DOI:10.1103/PhysRevC.93.034913
Phys. Rev. C **93**, no. 3, 034913 (2016)
CERN-PH-EP-2015-152
- **“Centrality dependence of high- p_T D meson suppression in Pb-Pb collisions at $\sqrt{s_{\text{NN}}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1506.06604 [nucl-ex]
DOI:10.1007/JHEP11(2015)205, 10.1007/JHEP06(2017)032
JHEP **1511**, 205 (2015), Addendum: [JHEP **1706**, 032 (2017)]
CERN-PH-EP-2015-151

- **“Measurement of jet quenching with semi-inclusive hadron-jet distributions in central Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1506.03984 [nucl-ex]
 DOI:10.1007/JHEP09(2015)170
 JHEP **1509**, 170 (2015)
 CERN-PH-EP-2015-136
- **“Measurement of charm and beauty production at central rapidity versus charged-particle multiplicity in proton-proton collisions at $\sqrt{s} = 7$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1505.00664 [nucl-ex]
 DOI:10.1007/JHEP09(2015)148
 JHEP **1509**, 148 (2015)
 CERN-PH-EP-2015-091
- **“Inclusive, prompt and non-prompt J/ψ production at mid-rapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1504.07151 [nucl-ex]
 DOI:10.1007/JHEP07(2015)051
 JHEP **1507**, 051 (2015)
 CERN-PH-EP-2015-092
- **“Measurement of pion, kaon and proton production in proton-proton collisions at $\sqrt{s} = 7$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1504.00024 [nucl-ex]
 DOI:10.1140/epjc/s10052-015-3422-9
 Eur. Phys. J. C **75**, no. 5, 226 (2015)
 CERN-PH-EP-2015-068
- **“Coherent ρ^0 photoproduction in ultra-peripheral Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1503.09177 [nucl-ex]
 DOI:10.1007/JHEP09(2015)095
 JHEP **1509**, 095 (2015)
 CERN-PH-EP-2015-082
- **“Rapidity and transverse-momentum dependence of the inclusive J/ψ nuclear modification factor in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].
 arXiv:1503.07179 [nucl-ex]
 DOI:10.1007/JHEP06(2015)055
 JHEP **1506**, 055 (2015)
 CERN-PH-EP-2015-030
- **“Measurement of dijet k_T in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
 J. Adam *et al.* [ALICE Collaboration].

arXiv:1503.03050 [nucl-ex]
DOI:10.1016/j.physletb.2015.05.033
Phys. Lett. B **746**, 385 (2015)
CERN-PH-EP-2015-041

- **“Measurement of charged jet production cross sections and nuclear modification in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1503.00681 [nucl-ex]
DOI:10.1016/j.physletb.2015.07.054
Phys. Lett. B **749**, 68 (2015)
CERN-PH-EP-2015-040
- **“Measurement of jet suppression in central Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1502.01689 [nucl-ex]
DOI:10.1016/j.physletb.2015.04.039
Phys. Lett. B **746**, 1 (2015)
CERN-PH-EP-2015-023
- **“Two-pion femtoscopy in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1502.00559 [nucl-ex]
DOI:10.1103/PhysRevC.91.034906
Phys. Rev. C **91**, 034906 (2015)
CERN-PH-EP-2015-019
- **“Forward-backward multiplicity correlations in pp collisions at $\sqrt{s} = 0.9, 2.76$ and 7 TeV”**
J. Adam *et al.* [ALICE Collaboration].
arXiv:1502.00230 [nucl-ex]
DOI:10.1007/JHEP05(2015)097
JHEP **1505**, 097 (2015)
CERN-PH-EP-2015-012