

RAPORT INTERMEDIAR

Program: CAPACITATI/Modul3

Contract: CERN-ALICE nr. 2/03.01.2012

Proiect: Contributia IFIN-HH la Experimentul ALICE de la LHC

Perioada raportata: 11.12.2011-10.12.2012

Faza: *Experimente cu ciocniri $p+p$, $A+A$, $p+A$.*

Algoritmi de „tracking” de mare eficacitate pentru TRD.

Studiul performantei de selectie a variabilelor de forma a

evenimentului pentru evenimentele de interes, analiza datelor

Monte Carlo si experimentale



Esperimente cu ciocniri p+p, A+A, p+A

- p+p & p+A experiments; shifts at the Subdetectors and Central

Subsystems:

- TRD + TPC
- DCS
- DAQ
- DQM + HLT

-2 blocks TPC+TRD offline

-2 blocks at Detector Control System

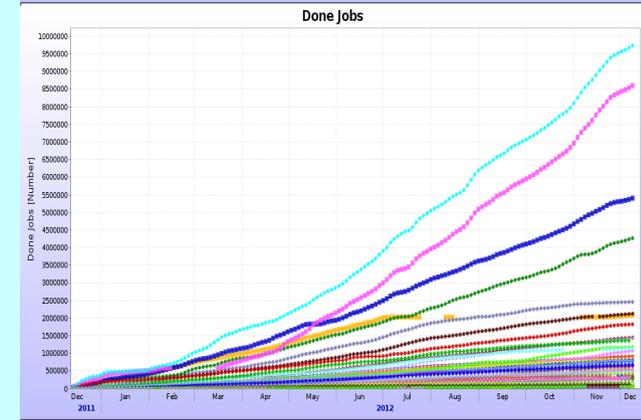
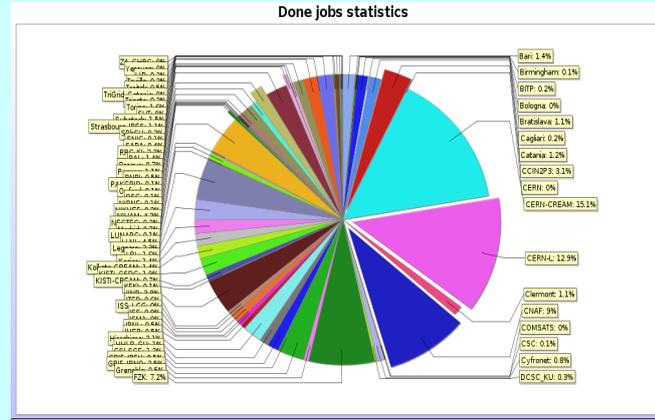
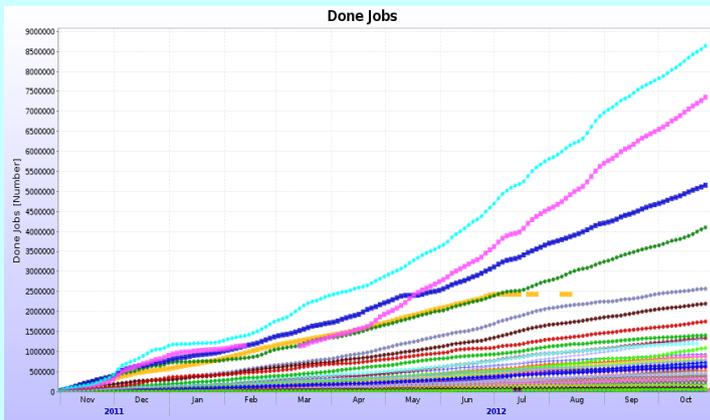
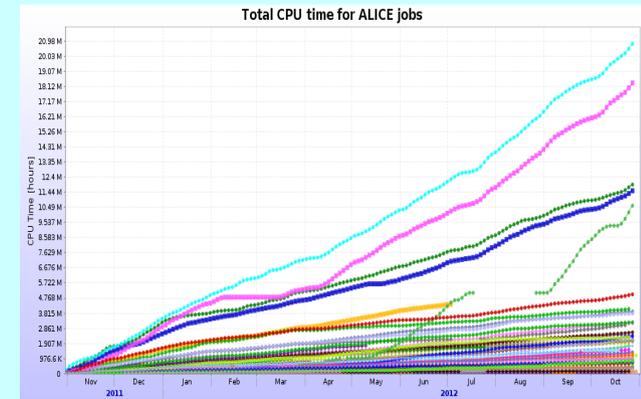
-2 blocks at Data Acquisition system+Central Trigger Processor+High Level Trigger

-1 block at Data Quality Monitoring

-5 shifts as Shift Leader in Matters of Safety

1 block=6 shifts

- NIHAM contribution to ALICE GRID



- Bari - Birmingham - BITP - Bologna - Bratislava - Cagliari - Catania - CCIN2P3 - CERN - CERN-CREAM - CERN-L - Clermont - CNAF - COMSATS - CSC - Cyfronet - DCSC_KU - FZK - Grenoble - GRIF_IPNO - GRIF_IRFU - GSI/SGE - HHLL_GU - Hiroshima - IHEP - IPNL - ISMA - ISS - ISS_LCG - ITEP - JINR - KFKI - KISTI-CREAM - KISTI_GSDC - Kolkata-CREAM - Kosice - LBL - Legnaro - LLNL - LUNARC - Madrid - NECTEC - NIHAM - NIKHEF - NIPNE - OXFORD - OXFORD - PAKGRID - PANI - Poznan - Prague - RAL - RRC-KI - SARA - SNIC - SPbSU - Strasbourg_IRS - Subatech - SUT - Torino - Trieste - TriGrid_Catania - Troitsk - Trujillo - UIB - Yerevan - ZA_CHPC

- Bari - Birmingham - BITP - Bologna - Bratislava - Cagliari - Catania - CCIN2P3 - CERN - CERN-CREAM - CERN-L - Clermont - CNAF - COMSATS - CSC - Cyfronet - DCSC_KU - FZK - Grenoble - GRIF_IPNO - GRIF_IRFU - GSI/SGE - HHLL_GU - Hiroshima - IHEP - IPNL - ISMA - ISS - ISS_LCG - ITEP - JINR - KFKI - KISTI-CREAM - KISTI_GSDC - Kolkata-CREAM - Kosice - LBL - Legnaro - LLNL - LUNARC - Madrid - NECTEC - NIHAM - NIKHEF - NIPNE - OXFORD - PAKGRID - PANI - Poznan - Prague - RAL - RRC-KI - SARA - SNIC - SPbSU - Strasbourg_IRS - Subatech - SUT - Torino - Trieste - TriGrid_Catania - Troitsk - Trujillo - UIB - Yerevan - ZA_CHPC

- Athens - Bari - Birmingham - BITP - Bologna - Bratislava - Cagliari - Catania - CCIN2P3 - CERN - CERN-CREAM - CERN-L - Clermont - CNAF - COMSATS - CSC - Cyfronet - DCSC_KU - FZK - Grenoble - GRIF_IPNO - GRIF_IRFU - GSI/SGE - HHLL_GU - Hiroshima - IHEP - IPNL - ISMA - ISS - ISS_LCG - ITEP - JINR - KFKI - KISTI-CREAM - KISTI_GSDC - Kolkata-CREAM - Kosice - LBL - Legnaro - LLNL - LUNARC - Madrid - NECTEC - NIHAM - NIKHEF - NIPNE - OXFORD - OXFORD - PAKGRID - PANI - Poznan - Prague - RAL - RRC-KI - SARA - SNIC - SPbSU - Strasbourg_IRS - Subatech - SUT - Torino - Trieste - TriGrid_Catania - Troitsk - Trujillo - UIB - Yerevan - ZA_CHPC

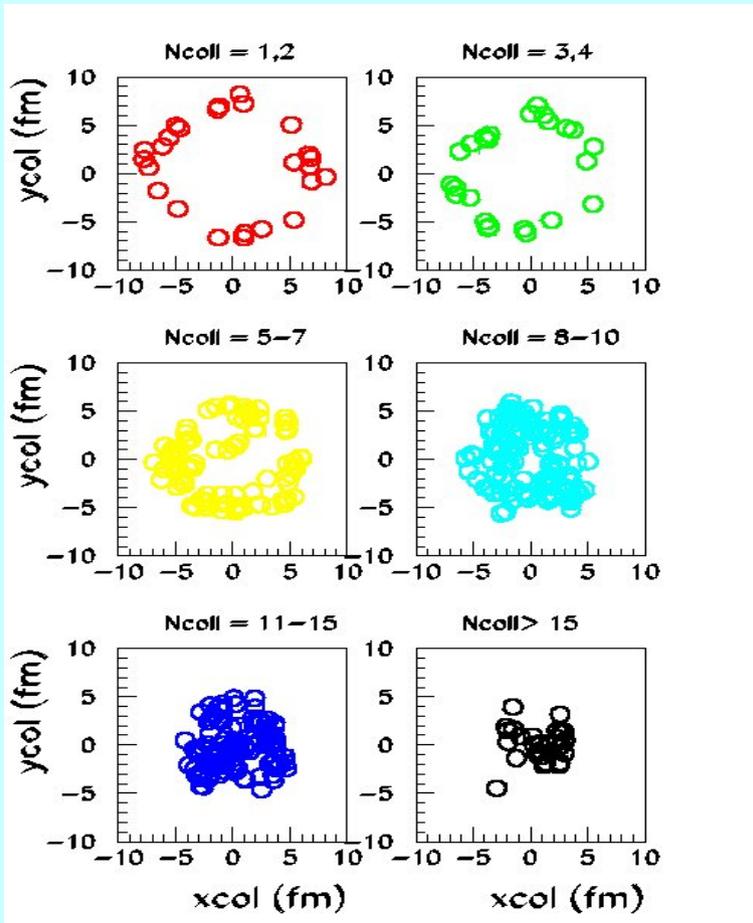
Algoritmi de „tracking” de mare eficacitate pentru TRD

Alexandru Bercuci

- Status of the TRD reconstruction
A. Bercuci,, PWG-PP tracking and alignment meeting, November 3 2011
- Possibility of ITS-TRD matching
A. Bercuci, PWG-PP tracking and alignment meeting, January 19 2012
- TRD-ITS matching performance for Pb-Pb
A. Bercuci, PWG-PP tracking and alignment meeting, February 2 2012
- TRD alignment update
A. Bercuci, PWG-PP tracking and alignment meeting, March 22 2012
- Tracking PID non uniformity
A. Bercuci, PWG-PP tracking and alignment meeting, April 5 2012
- LHC12c,d: TRD
A. Bercuci,
ALICE QA meeting, May 5 2012
- LHC12a,b TRD
A. Bercuci
ALICE QA meeting, August 7 2012
- TRD
A. Bercuci, ALICE Offline week, November 11 2011

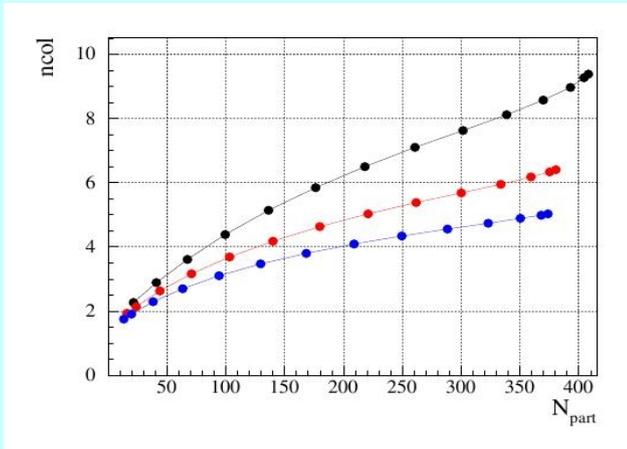
Studiul performantei de selectie a variabilelor de forma a evenimentului pentru evenimentele de interes, Analiza Monte Carlo si experimentale

Event #n

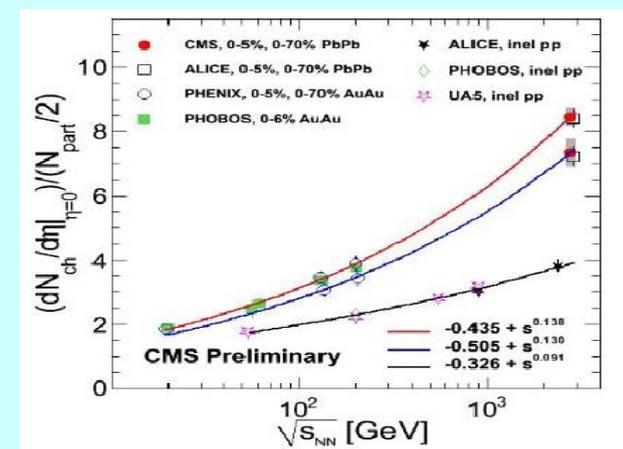


Pb+Pb

b=0, head-on collisions



$$\Rightarrow \langle dN_{ch}/d\eta \rangle^{9 \text{ coll hot spot}} \approx 36$$



Which is the difference or similarity between the properties and dynamics of such a hot spot and what is produced in a p+p collision with a similar multiplicity?

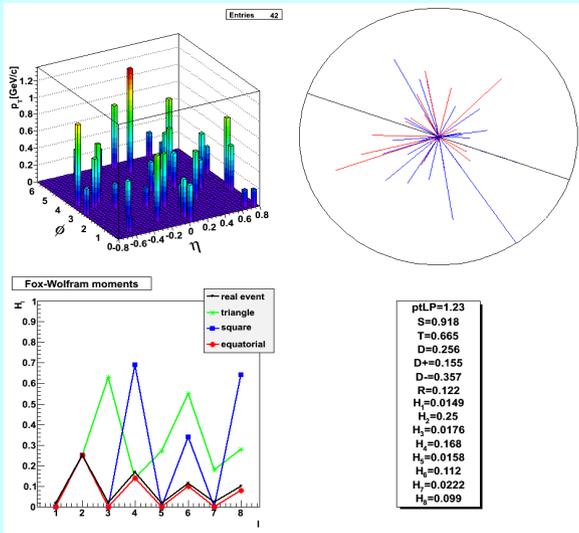
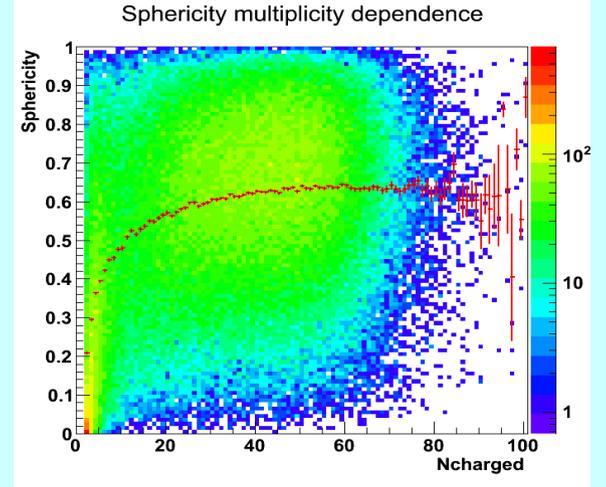
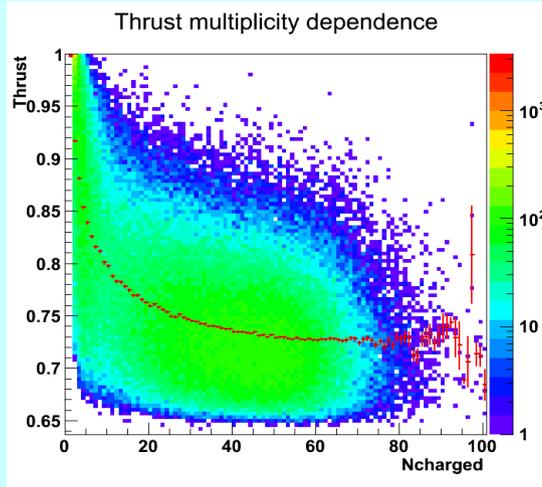
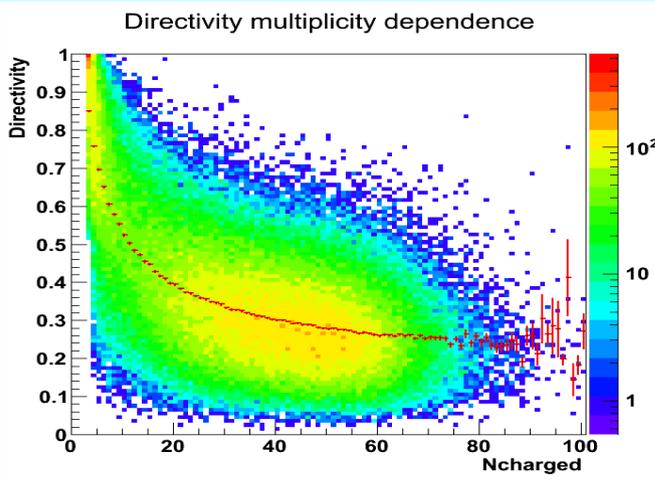
Global event shape variables and their performance

$$D^\pm = \frac{|\sum_i \vec{p}_{t,i}|}{\sum_i |\vec{p}_{t,i}|} \Big|_{\eta^{pos/neg}}$$

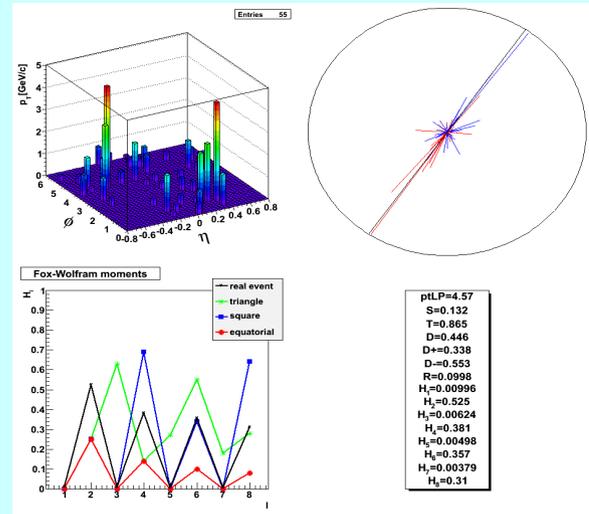
$$T = \underbrace{\max}_{\vec{n}_T} \frac{\sum_i |\vec{p}_{t,i} \cdot \vec{n}_T|}{\sum_i |\vec{p}_{t,i}|}$$

$$S_\perp = \frac{2\lambda_2}{\lambda_2 + \lambda_1}$$

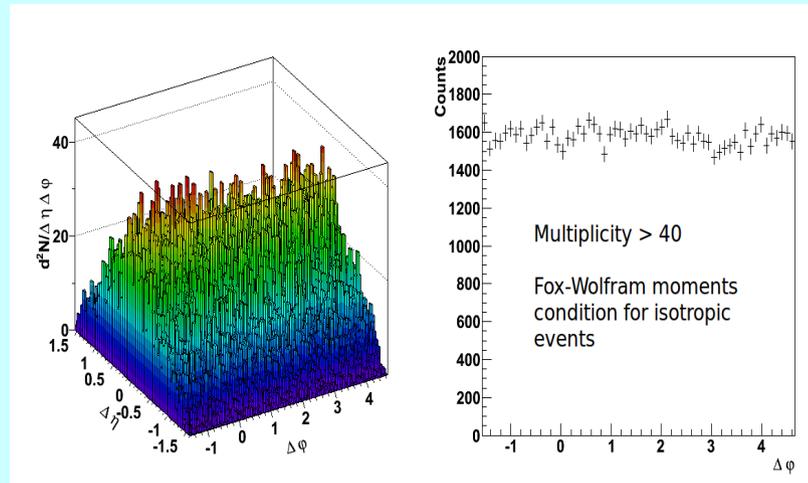
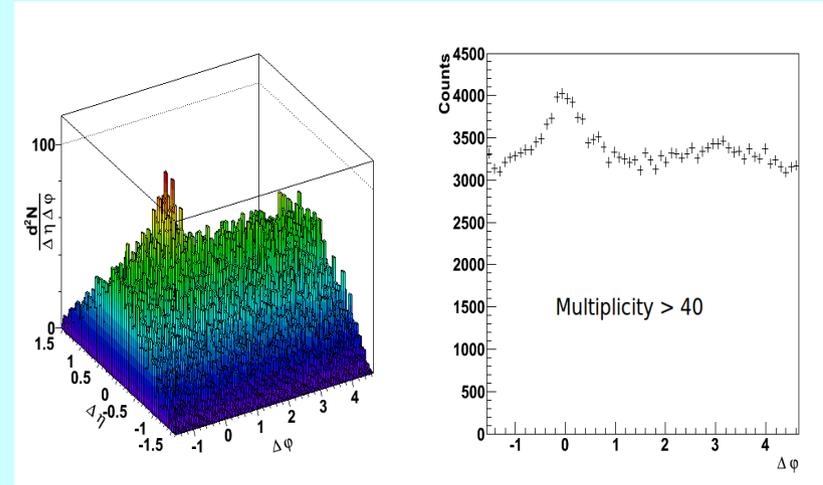
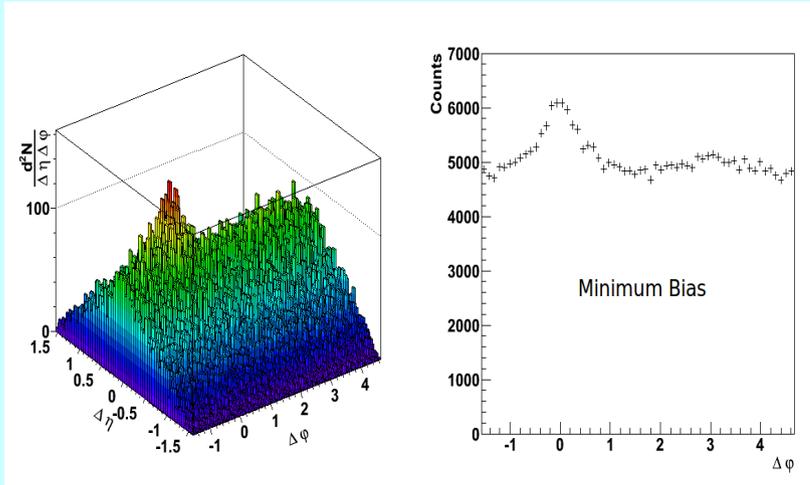
$$S_{xy} = \frac{1}{\sum_i p_T^i} \sum_i \begin{pmatrix} p_x^{(i)^2} & p_x^{(i)} \cdot p_y^{(i)} \\ p_x^{(i)} \cdot p_y^{(i)} & p_y^{(i)^2} \end{pmatrix}$$



$$H_l = \frac{\sum_{i,j} p_i p_j P_l(\cos\phi_{ij})}{\sum_{i,j} p_i p_j}$$



Global event shape variables and their performance



Global event shape variables and their performance

- **Transverse momentum distributions of pions, kaons and protons vs. multiplicity and event shape in p+p collisions at 7 TeV**
C. Andrei, I. Berceanu, A. Bercuci, A. Herghelegiu, F.Noferini, M. Petrovici, A. Pop
Spectra weekly meeting 10.11.2011
- **Weighted efficiency correction for charged hadrons – preliminary results**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, , M. Petrovici, A. Pop
Spectra weekly meeting 10.11.2011
- **Transverse momentum distributions of pions, kaons and protons vs. multiplicity and event shape in p+p collisions at 7 TeV**
C. Andrei, I. Berceanu, A. Bercuci, A. Herghelegiu, F.Noferini, M. Petrovici, A. Pop
PWG2 meeting 15.11.2011
- **The status of the DCA-based correction for material a weak decays feed-down in multiplicity bins**
Andrei, I. Berceanu, A. Bercuci, A. Herghelegiu, M. Petrovici, A. Pop, C. Schiaua,, F.Noferini
PWGLF/Spectra weekly meeting 26.01.2012
- **p_T distributions of charged hadrons and π , K and p for high multiplicity and close to azimuthal isotropic events in p + p collisions at 7 TeV**
C. Andrei, I. Berceanu, A. Bercuci, A. Herghelegiu, F.Noferini, M. Petrovici, A. Pop
PWGLF/Spectra weekly meeting 05.04.2012
- **p_T distributions of charged hadrons and π , K and p for high multiplicity and close to azimuthal isotropic events in p + p collisions at 7 TeV**
C. Andrei, I. Berceanu, A. Bercuci, A. Herghelegiu, F.Noferini, M. Petrovici, A. Pop
PWGLF/Spectra weekly meeting 12.04.2012
- **Multiplicity dependence of the efficiency correction**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, M. Petrovici, A. Pop
PWGLF/Spectra weekly meeting, March 8 2012
- **Transverse momentum distributions of charged particles in p-p collisions at 7 TeV as a function of multiplicity**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, M. Petrovici, A. Pop
PWGLF/Spectra weekly meeting, May 10 2012
- **Transverse momentum distributions of charged particles in p-p collisions at 7 TeV**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, M. Petrovici, A. Pop
PWGLF/Spectra PAG weekly meeting, August 23 2012
- **Transverse momentum distributions of charged particles in p-p collisions at 7 TeV**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, M. Petrovici, A. Pop
PWGLF/Spectra PAG weekly meeting, August 30 2012
- **Transverse momentum distributions of charged particles in p-p collisions at 7 TeV**
A. Herghelegiu, C. Andrei, I. Berceanu, A. Bercuci, M. Petrovici, A. Pop
PWG-LF ALICE mini-week, September 3 2012

Coautori conferinte, lucrari ISI

- Suppression of high transverse momentum prompt D mesons in central Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV, Colaborarea ALICE JHEP 9(2012)112
- Transverse sphericity of primary charged particle in minimum bias proton-proton collision at $\sqrt{s}=0.9, 2.76$ and 7 TeV, Colaborarea ALICE Eur.Phys.J. C(2012)72
- J/Psi suppression at forward rapidity in Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV, Colaborarea ALICE. Phys.Rev.Lett 109(2012)072301
- Measurement of Event Background Fluctuations for Charged Particle Jet Reconstruction in Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV, Colaborarea ALICE, JETP 03(2012)053
- Particle-yield modification in jet-like azimuthal di-hadron correlations in Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV, Colaborarea ALICE Phys.Rev.Lett. 108(2012)092301
- Harmonic decomposition of two-particle correlations in Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV, Colaborarea ALICE Phys.Lett. B708(2012)249

- *Contributii orale ale Colaborarii ALICE la Quark Matter 2012, Washington D. C., SUA, 13-18 August 2012: 30*

- *Postere ale Colaborarii ALICE la Quark Matter 2012, Washington D. C., SUA, 13-18 August 2012: 48*

- *Contributii trimise pentru: Proceedings of the Fifth International Conference on Hard and Electromagnetic Probes of High Energy Nuclear Collisions (Hard Probes 2012), May 27 - June 1, Cagliari, Italy: 11*

- *“Review” institutional: - 2 lucrari ALICE*

- *Vizibilitate:*
 - <http://alicematters.web.cern.ch/?q=ifin-hh>
IFIN-HH, Romania - 'The Thinkers' of ALICE
 - <https://espace.cern.ch/alice-mgt-vipvisits/Romania/default.aspx>
Romania_and_ALICE_2012Feb_NIPNE