ALICE Off-line news and PDC09 results

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for the AliFemto group
Preparing PWG2 Analysis Train

• Analysis Train car from AliFemto consists of analysis code (PWG2femtoscopy and PWG2femtoscopyUser libraries) and the configuration macro

• The configuration macro contains:
  - Assumes large scale datasample (~100M events)
  - Uses MC information (PID for weight generation)
  - Positive pion analysis (1D CF x 3kT bins, 3D CF x 3 kT bins, SH CF x 3 kT bins, two-particle QA)
  - Negative pion analysis (1D CF x 3kT bins, 3D CF x 3 kT bins, SH CF x 3kT bins, two-particle QA)
  - Positive kaon analysis (1D CF, 3D CF, two-particle QA)
New Analysis Developments

- New way of adding Analysis cars to the train is required: the AddTask.C macro
  - AddTaskFemto.C macro was added to the SVN and all runZZZ.C macros were updated
- Par file usage is discouraged on the GRID
  - Offline will provide regular snapshots of the SVN trunk and will propagate them to the GRID
  - Current version for analysis is: ROOT 5-23-04 and AliRoot v4-17-01 (from SVN trunk)
- AliAnalysisTaskFemto has been updated to correspond to the new changes.
100M pp events available

- The massive pp production (~100M events) is done and available on the GRID
  - The PWG2 train will be run on this production
  - Test Femto macro was run on the subset of this data, results later in this talk
- Macro for automatic merging of Femto output files was created
  - Converts the output list to flat directory and adds histograms via hadd

alien://alice/cern.ch/user/a/akisiel/PDC09/PWG2FemtoTrainII/Merge
First test

- Defined the source in LCMS (sizes Rout = 1.8, Rside = 1.3, Rlong = 1.6 [fm])
- Used PRF coordinates in the spherical harmonics decomposition
- Discovered a problem with particle ordering in the pair
- Had to fix both the analysis code and the macro:
  - Flip pair ordering for identical pairs, for every other pair
  - Use LCMS coordinates for the SH functions
Problem with ordering
LCMS source seen in PRF

kt1
kt2
kt3
Fixed analysis: Event multiplicity

- ~6M events analyzed

![Event multiplicity graph]

<table>
<thead>
<tr>
<th>EvMultcutPasspip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>RMS</td>
</tr>
</tbody>
</table>
Pt vs. rapidity

- Pt vs. rapidity acceptance – OK (electron contamination at low pt?)
Rapidity vs. phi acceptance

- No surprising effects. The problem with track chi2 (found thanks to Femto code) is fixed.
New quality plots: $\chi^2$/Ndof

$\chi^2$/Ndof. distribution

Average $\chi^2$/Ndof distribution
“True” vs. “Fake” CF, $kt_2$
Compare kt bins

(0.1, 0.27)

(0.27, 0.37)

(0.37, 0.52)
Compare fit results

- Fits to 3D Bertsch-Pratt LCMS correlation function
- Fit results for both “fake” and “true” correlation functions within 10% of the true values, except last bin
- Need to repeat with Coulomb on
Spherical harmonics example

\[ \begin{align*}
C_0^0 & \quad \text{real part} \quad \text{imaginary part} \\
C_1^0 & \quad C_1^1 \\
C_2^0 & \quad C_2^1 \quad C_2^2 \\
C_3^0 & \quad C_3^1 \quad C_3^2 \quad C_3^3
\end{align*} \]
Problem with ordering solved
LCMS source seen in LCMS

kt1
kt2
kt3