Performance of invariant mass fit method for global polarization measurements of $\Lambda$ hyperons in the MPD experiment

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P$_H$ at Nuclotron-NICA energies

\[
\frac{dN}{d\cos\theta^*} = \frac{1}{2}(1 + \alpha_H |P_H|^2 \cos\theta^*)
\]

NICA energy range will provide new insight of:
- Evolution of polarization at lower energies (model-dependent peak location)
- Origin of the global polarization signal (thermal approach, axial vortical effect, chiral vortical effect)

Studying the global polarization of $\Lambda$ with the MPD experiment will provide information about:
- $\Lambda(\bar{\Lambda})$ - splitting of global polarization
- Energy and kinematical dependences, improving precision
- Probing the vortical structure using various observables

\[ \Lambda \rightarrow p + \pi^- \]

$P_H$ using the azimuthal angle of proton:

\[ P_H = \frac{1}{2\pi} \frac{1}{N_{PE}} \frac{1}{N_{PE}} \sin(\Psi_{EP} - \phi^*) \]

$\phi^*$ - in $\Lambda$ rest frame

Event plane resolution is obtained from FHCal Selection of $\Lambda$ with $\omega_2 = \ln \frac{\chi^2}{\chi^2_{PE}}$ or $\chi^2(5$ parameters): $\chi^2_{PE}, \chi^2_{R}, \chi^2_{V0}$, path$_\Lambda$, angle$_\Lambda$

Fit inv mass in bins of selection parameters and take with maximum significance.

Conclusions
- We already have rather good $\Lambda$ selection and reconstruction for the MPD experiment.
- First results of invariant mass fit method was obtained for Monte-Carlo simulation for Bi+Bi at 9.2 GeV and it has an agreement with Monte-Carlo signal.
- Invariant mass fit method is more faster than $\Delta\phi$ fit method due to less fitting procedure and may have higher precision for bigger data sample.
- It is important to provide further implementation of Invariant mass fit method for global polarization measurements.