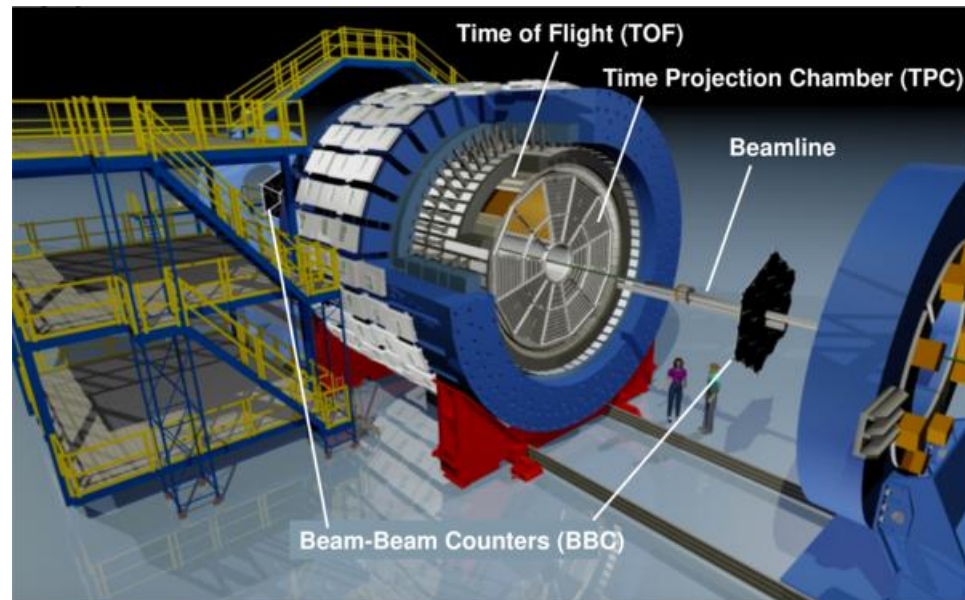
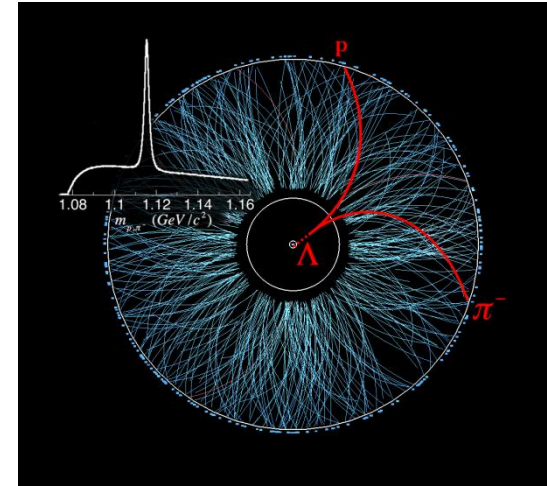
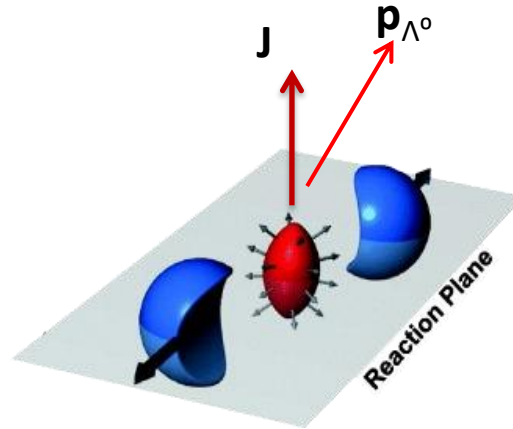
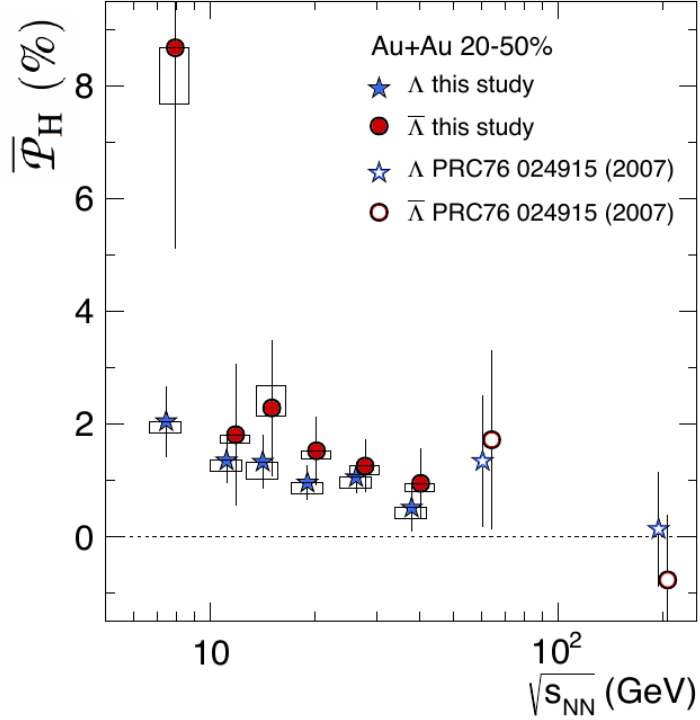


On the possibility of measuring the global polarization of Λ^0 -hyperons on MPD

Kechechyan A.

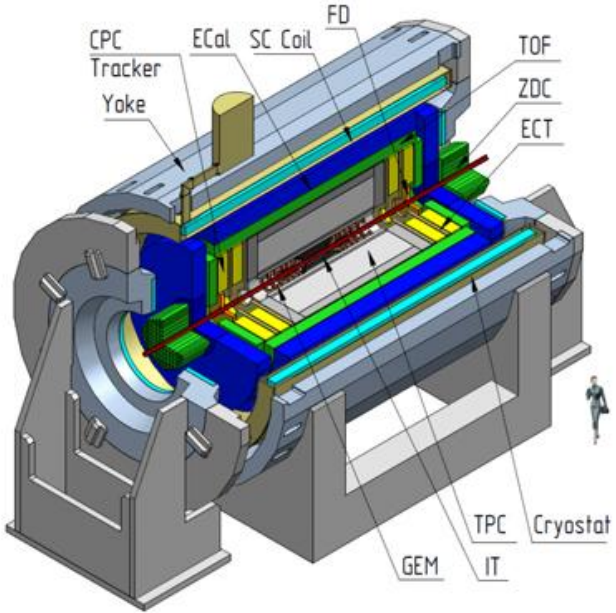
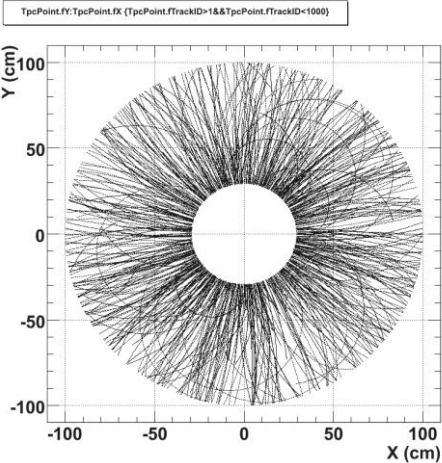
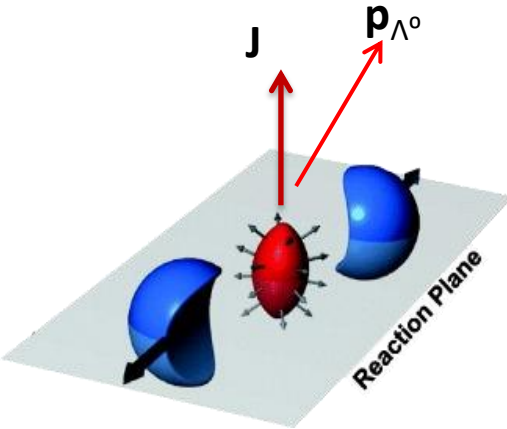
RHIC STAR BES I results

STAR, Nature 548, 62 (2017)



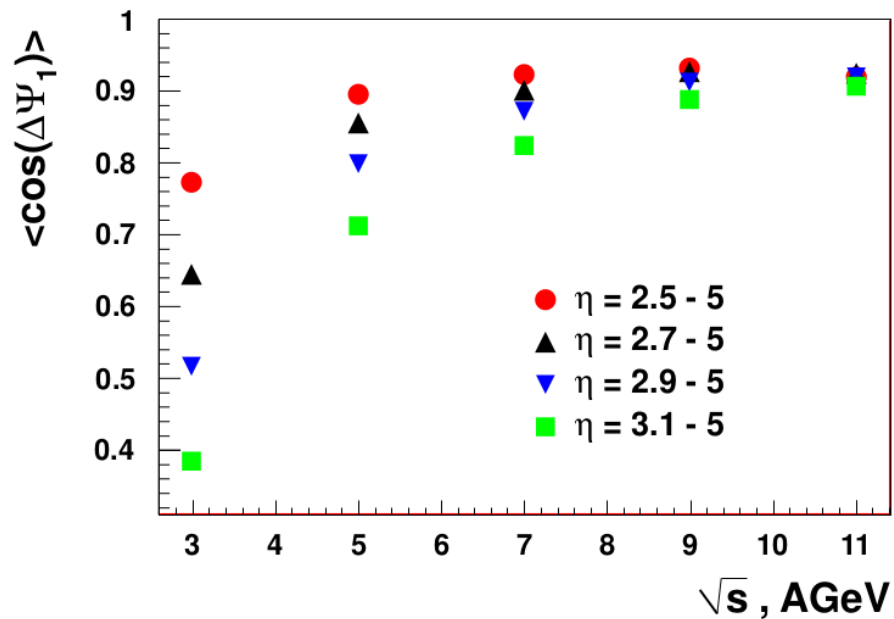
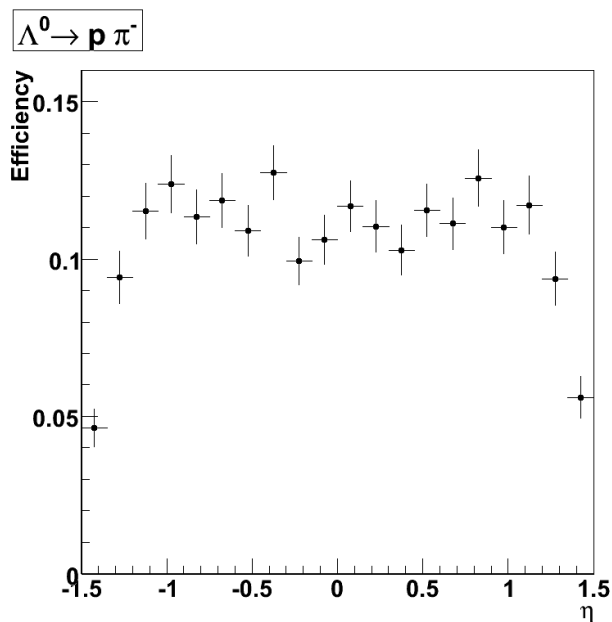
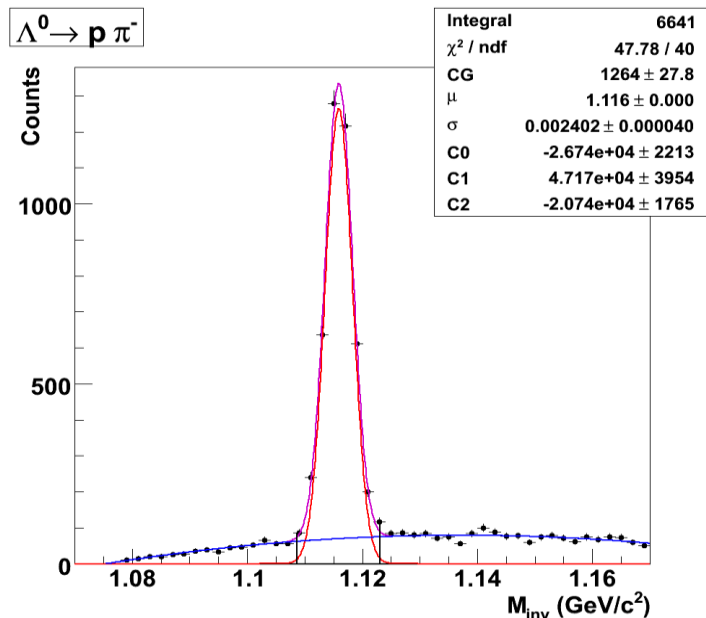
$\sqrt{s_{NN}}$ (GeV)	7.7	11.5	14.5	19.6	27	39
Λ	3.6σ	3.5σ	2.4σ	3.1σ	3.5σ	1.1σ
anti- Λ	2.2σ	2.1σ	1.1σ	2.4σ	2.9σ	1.6σ

NICA MPD



Results of the reconstruction of lambda and reaction plane

Λ^0 reconstruction

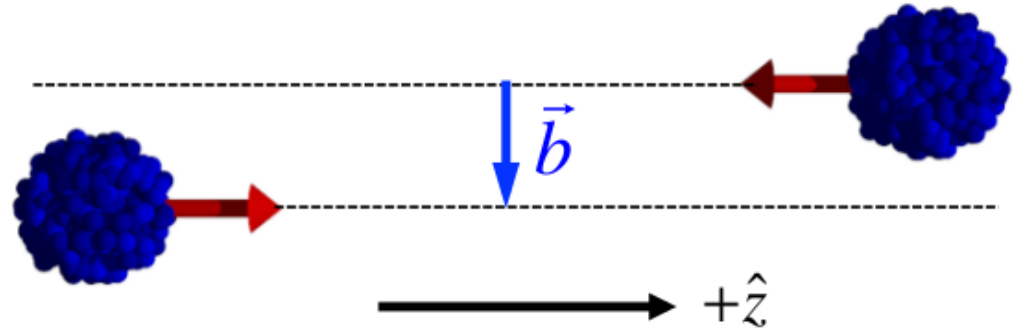
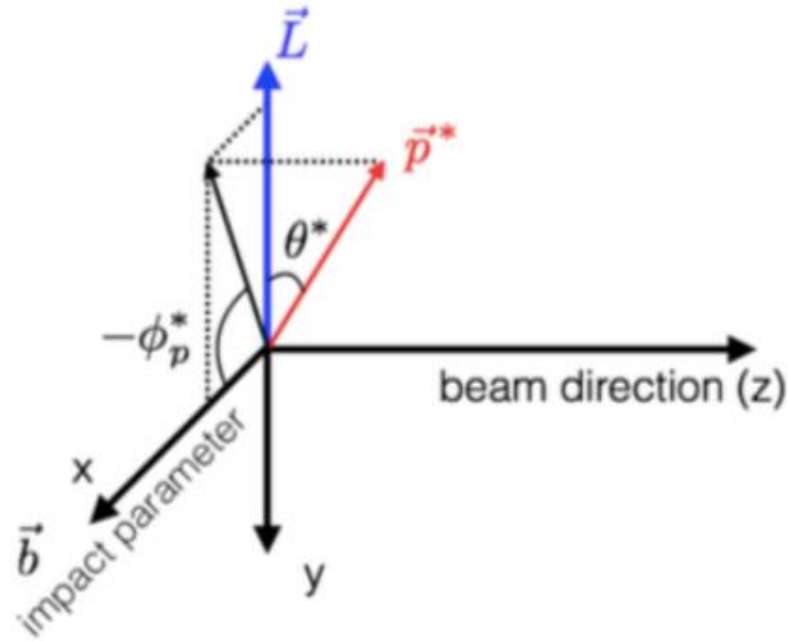


Reaction Plane resolution $\approx 22-30$

MPD 2013-03 PHYS-002

MPD meeting 04.02.2010

Variables



b - impact parameter

\vec{z} - beam direction

\vec{L} - direction of the system's angular momentum $= \vec{b} \times \vec{z}$

θ_{cm} - azimuthal angle of the proton from Λ decay in the Λ frame

$$\frac{dN}{d\Omega} = \frac{1}{4 \cdot \pi} \cdot (1 + \alpha \cdot P_{\Lambda} \cdot \cos \theta_{cm}) \quad \alpha = 0.642$$

$$P_{\Lambda} = \frac{1}{\alpha} \frac{\langle \cos(\theta_{cm}) \rangle}{\langle \cos^2(\theta_{cm}) \rangle}$$

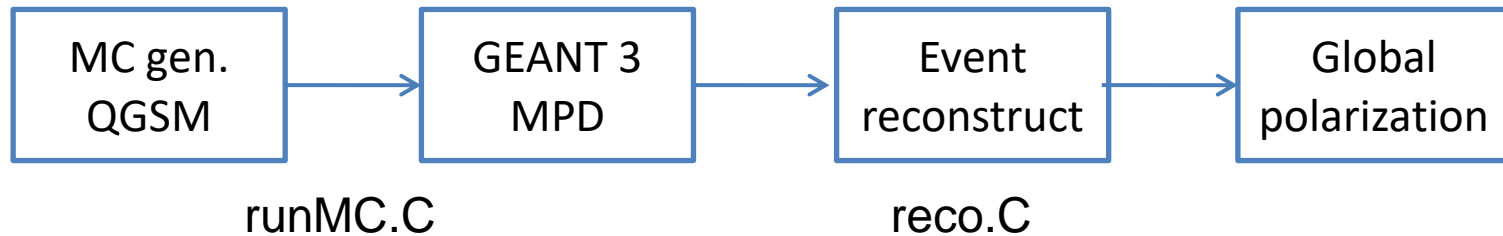
QGSM + Hydrodynamics

PHYSICAL REVIEW C 93, 031902(R) (2016)

M. Baznat, K. Gudima, A. Sorin, and O. Teryaev

Au+Au- \rightarrow Λ^0 +...

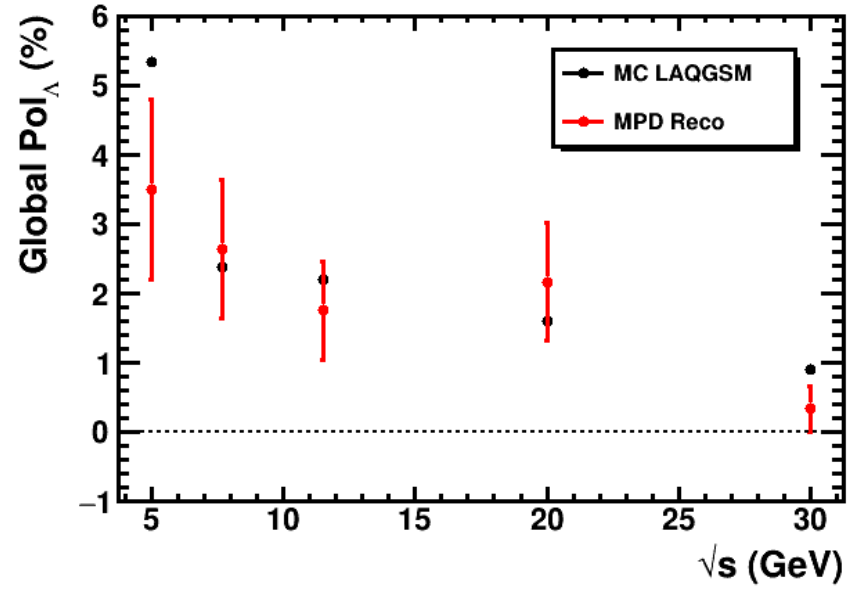
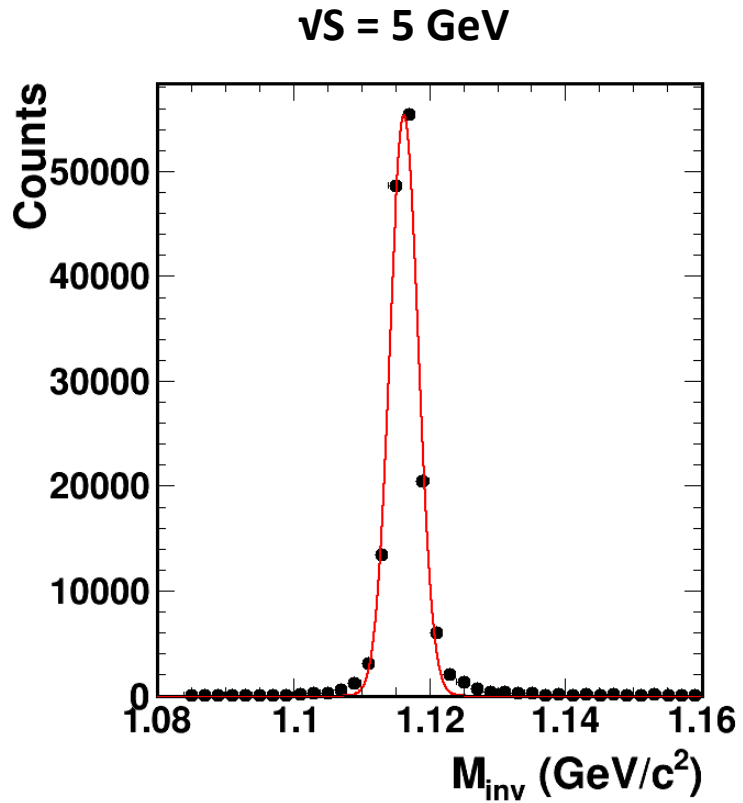
B = 8 fm (20%-50%)



$v_s(\text{GeV})$	5.0	7.7	11.5	20.0	30.0
$N_{\Lambda \text{ gen}}$	729k	689k	670k	646k	592k
$N_{\Lambda \text{ reco}}$	159k	159k	153k	150k	150k

$$\langle \epsilon_{\Lambda} \rangle = 22\%$$

Results



\sqrt{s} (GeV)	5.0	7.7	11.5	20.0	30.0
P_H (%)	3.50	2.65	1.76	2.18	0.34
n_σ	2.69	2.63	2.47	2.57	1.01

SUMMARY AND OUTLOOK

Summary:

The result agree with model calculation

It is possible to reconstruct the Λ^0 -hyperons global polarization on MPD facility, in principle.

Outlook:

- Reconstruction of $\Lambda^0(\bar{\Lambda}^0)$ -hyperons and its global polarization in full simulated events of AuAu collisions at NICA energies (5.0, 7.7 and 11.5 GeV) in MPD

Back up

V^0 reconstruction

DCA (cm)	Λ^0	K_s^0
Positive to primary vertex	>0.2	>0.2
Negative to primary vertex	>1.0	>0.2
Between daughters	<0.5	<0.5
Decay length	>0.5	>0.5

