

FIRST APPROACH ON INVERSE KINEMATICS

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FIRST STEPS PERFORMED

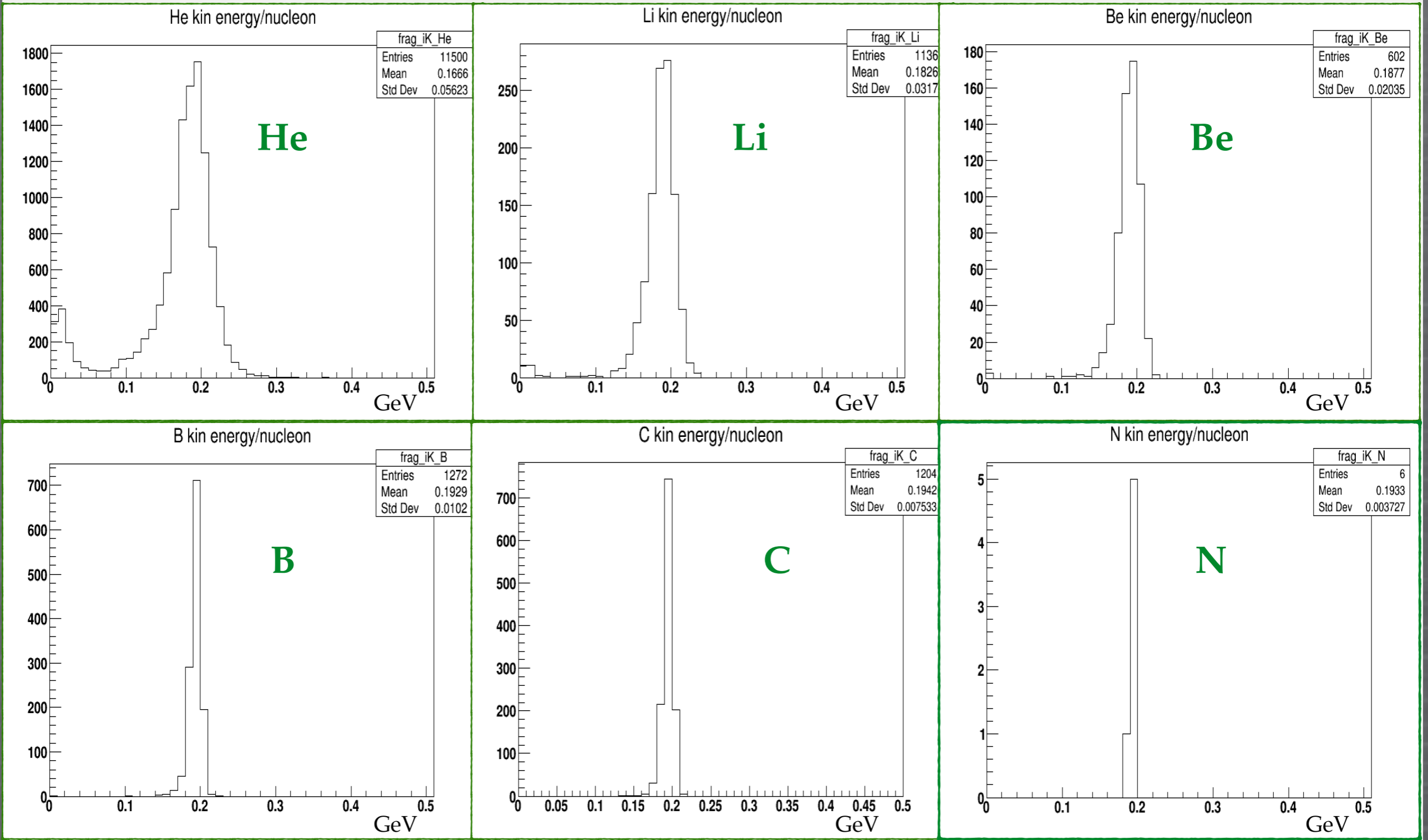
- **Aim:** reproduce / cross-check results obtained by Alessio and Elisabetta with an independent code
- **Framework:** official FOOT simulation software on Tier3 (many thanks to Alessio)
- Definition of a function devoted to inverse kinematics studies and cross section measurement, implemented in **RecoTools.cc** and **RecoTools.h**
- Estimation of fragments **kinematical variables** in direct and inverse kinematics using *true* particle information, i.e. no smearing effect applied

FIRST RESULTS

- Input file:
`/gpfs_data/local/foot/Simulation/NewGeo/12C_200_C2H4_highT_noMag.root`
- Selections:
 - carbon inelastic scattering in the target volume
 - fragments exiting the target
- No smearing effect applied
- Fragments selected according to their charge: He, Li, Be, B, C, N . Isotopes not distinguished
- Evaluation of fragments' energy, momentum and angle in direct and inverse kinematics
- Output: root file with set of histograms for each fragment charge (see next slides)
- Distributions in agreement with previous analysis, but statistics is much lower

FIRST RESULTS

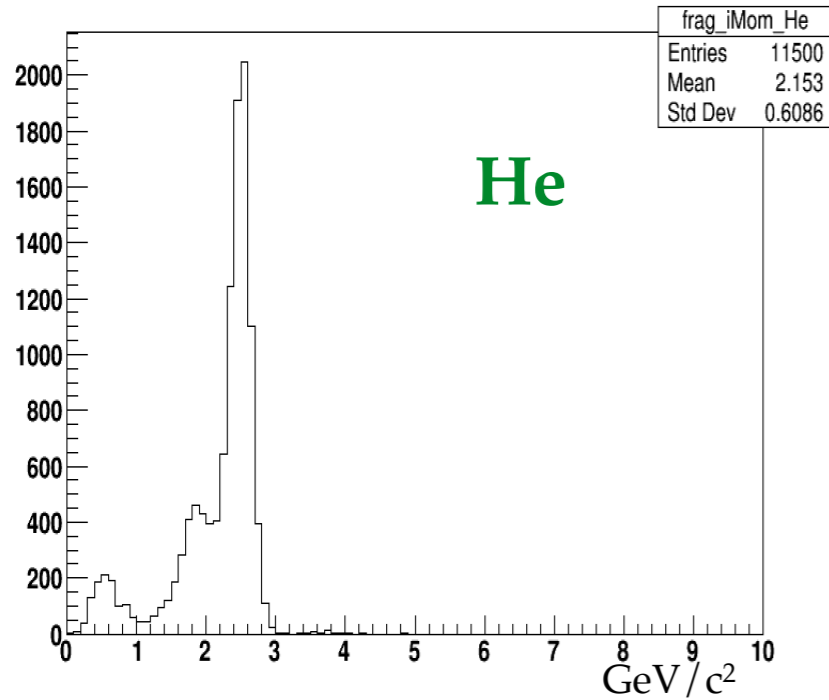
Kinetic Energy / nucleon
(DIRECT KINEMATICS)



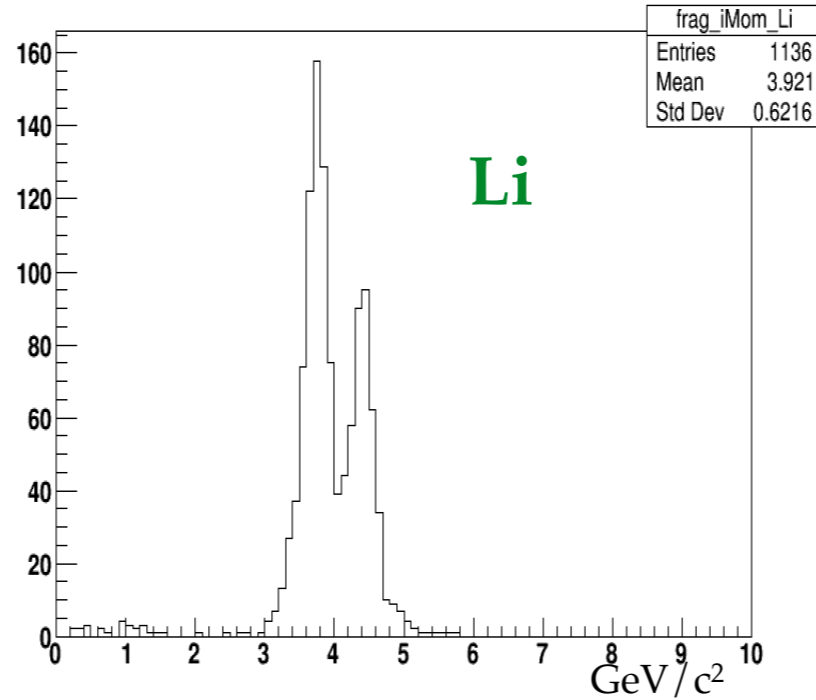
FIRST RESULTS

Momentum (DIRECT KINEMATICS)

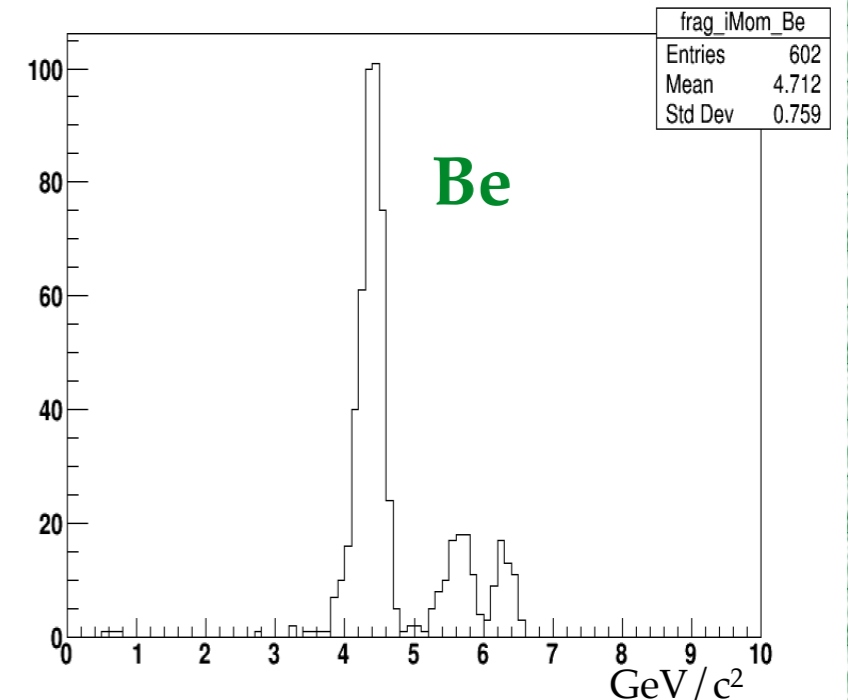
He momentum



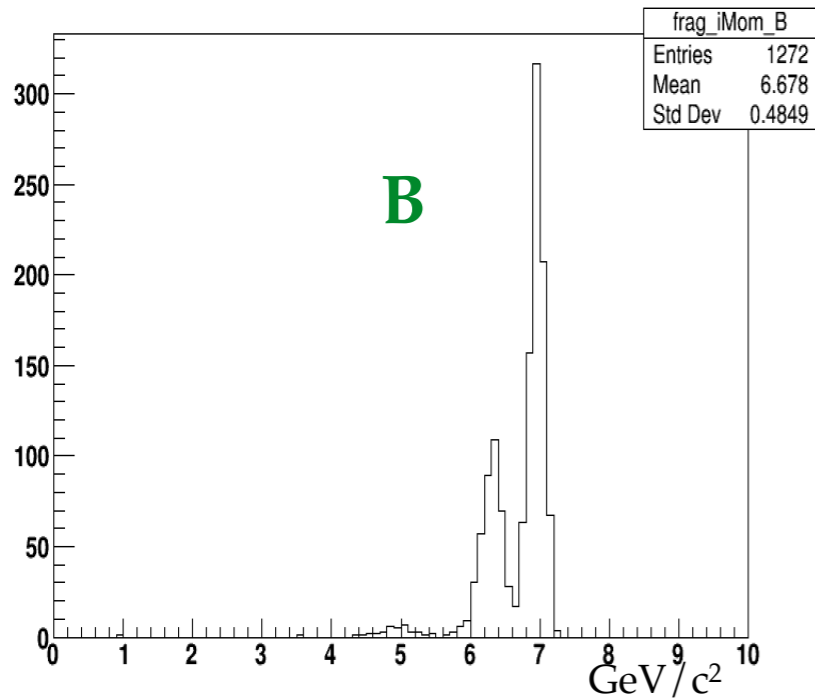
Li momentum



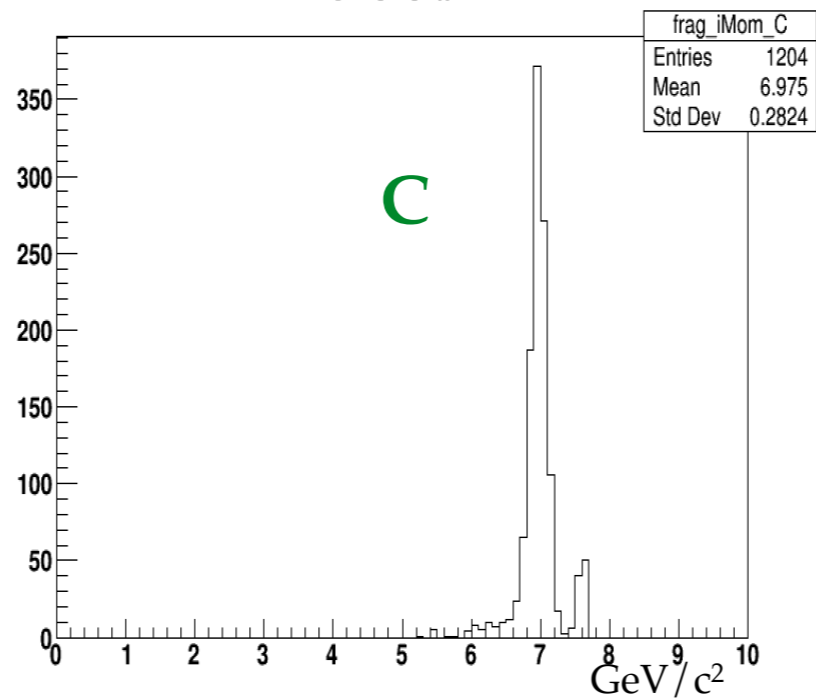
Be momentum



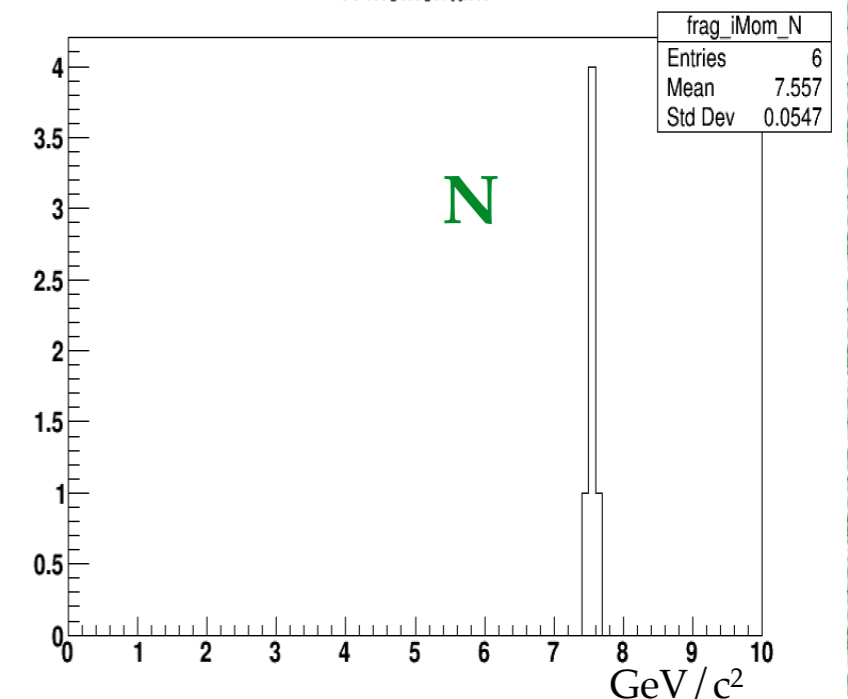
B momentum



C momentum

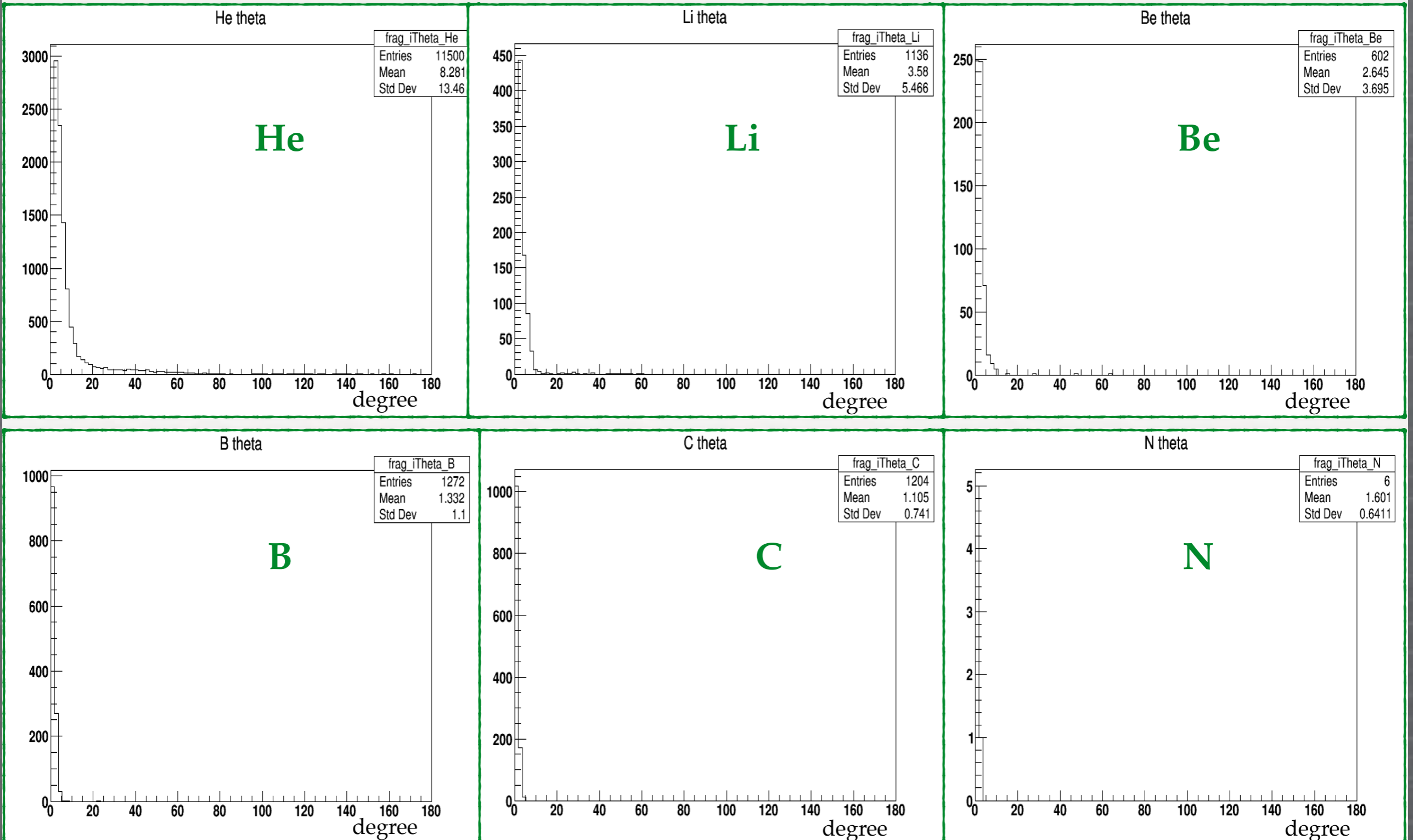


N momentum



FIRST RESULTS

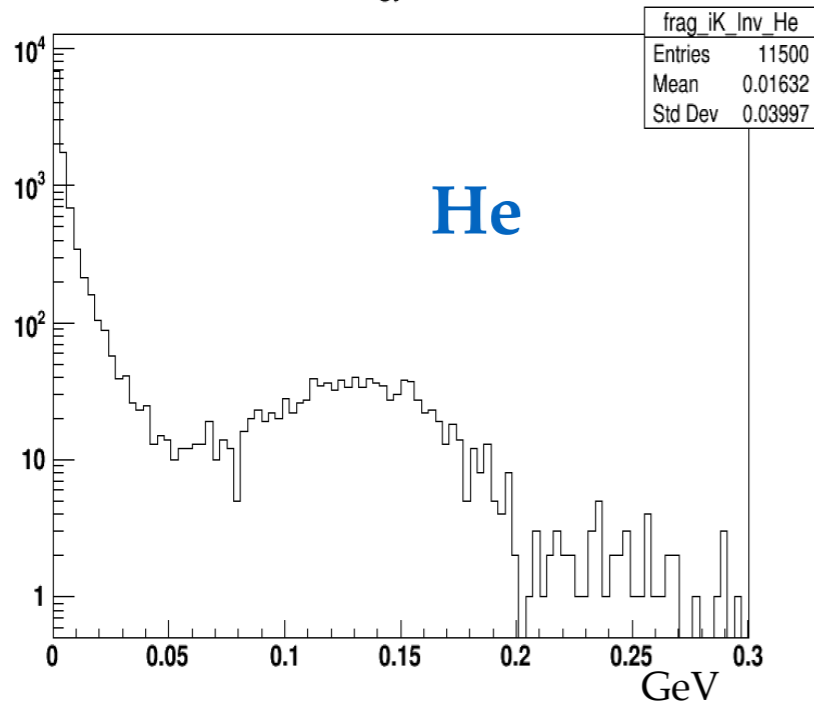
Theta angle
(DIRECT KINEMATICS)



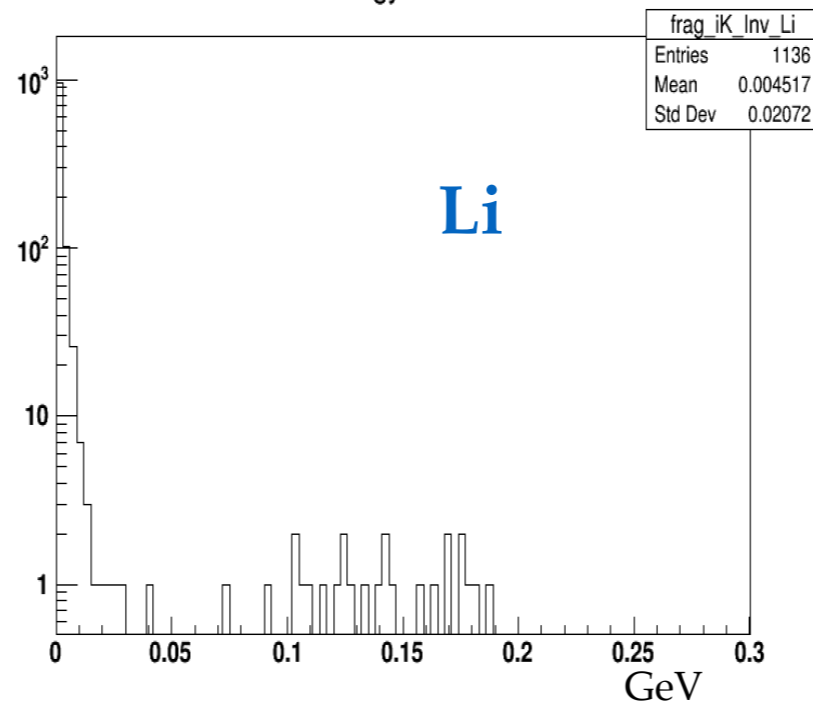
FIRST RESULTS

Kinetic Energy / nucleon
(INVERSE KINEMATICS)

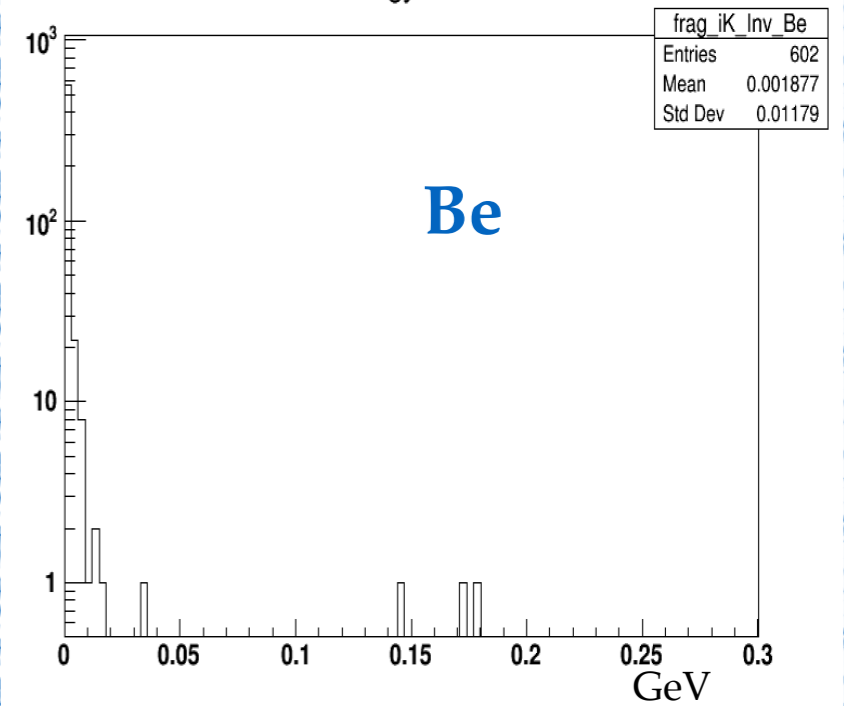
He kin energy/nucleon INV



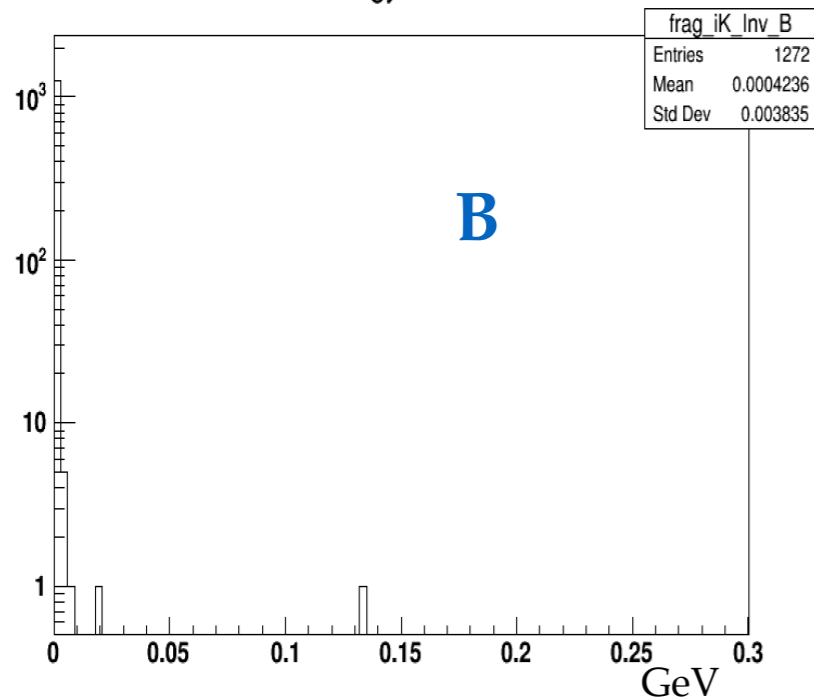
Li kin energy/nucleon INV



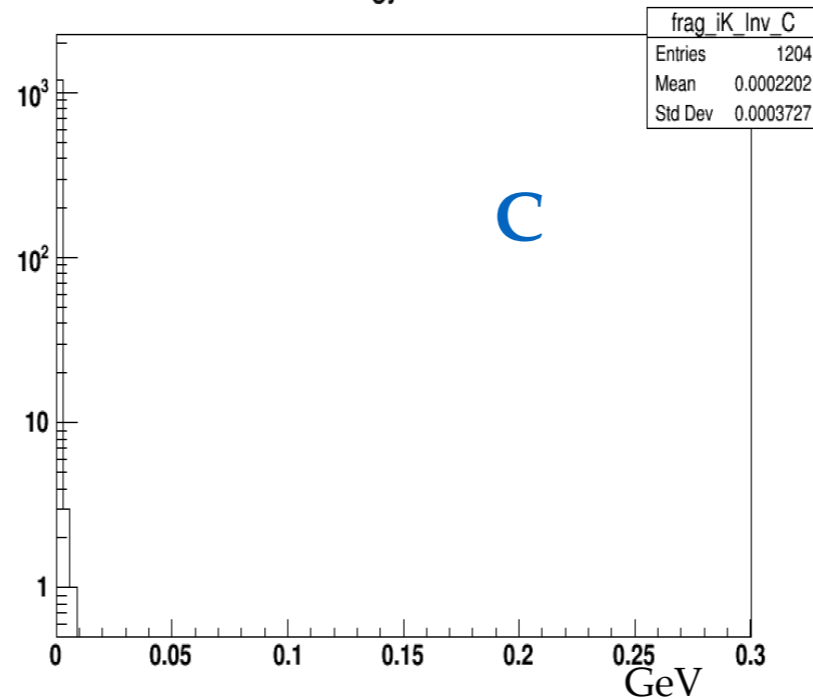
Be kin energy/nucleon INV



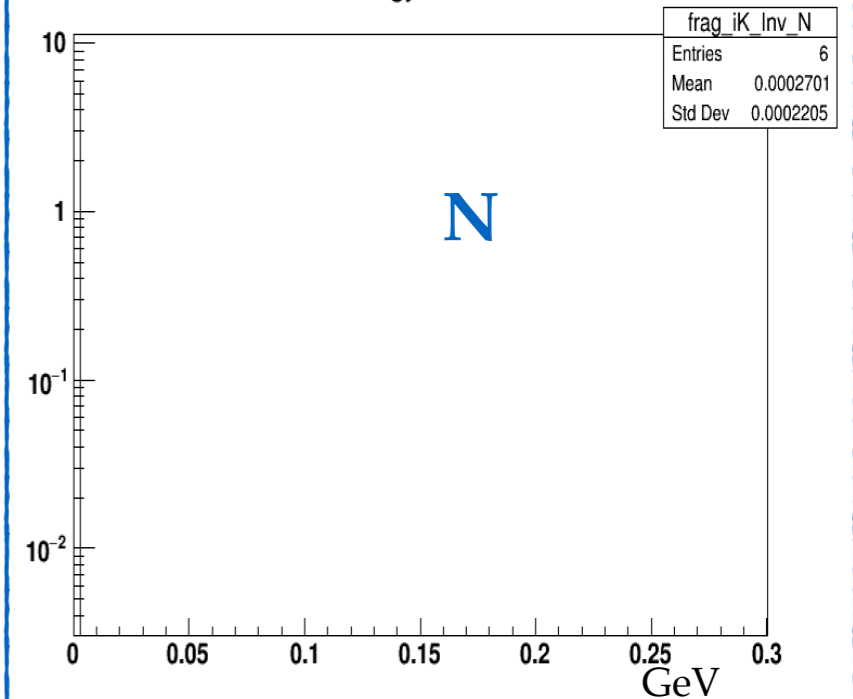
B kin energy/nucleon INV



C kin energy/nucleon INV

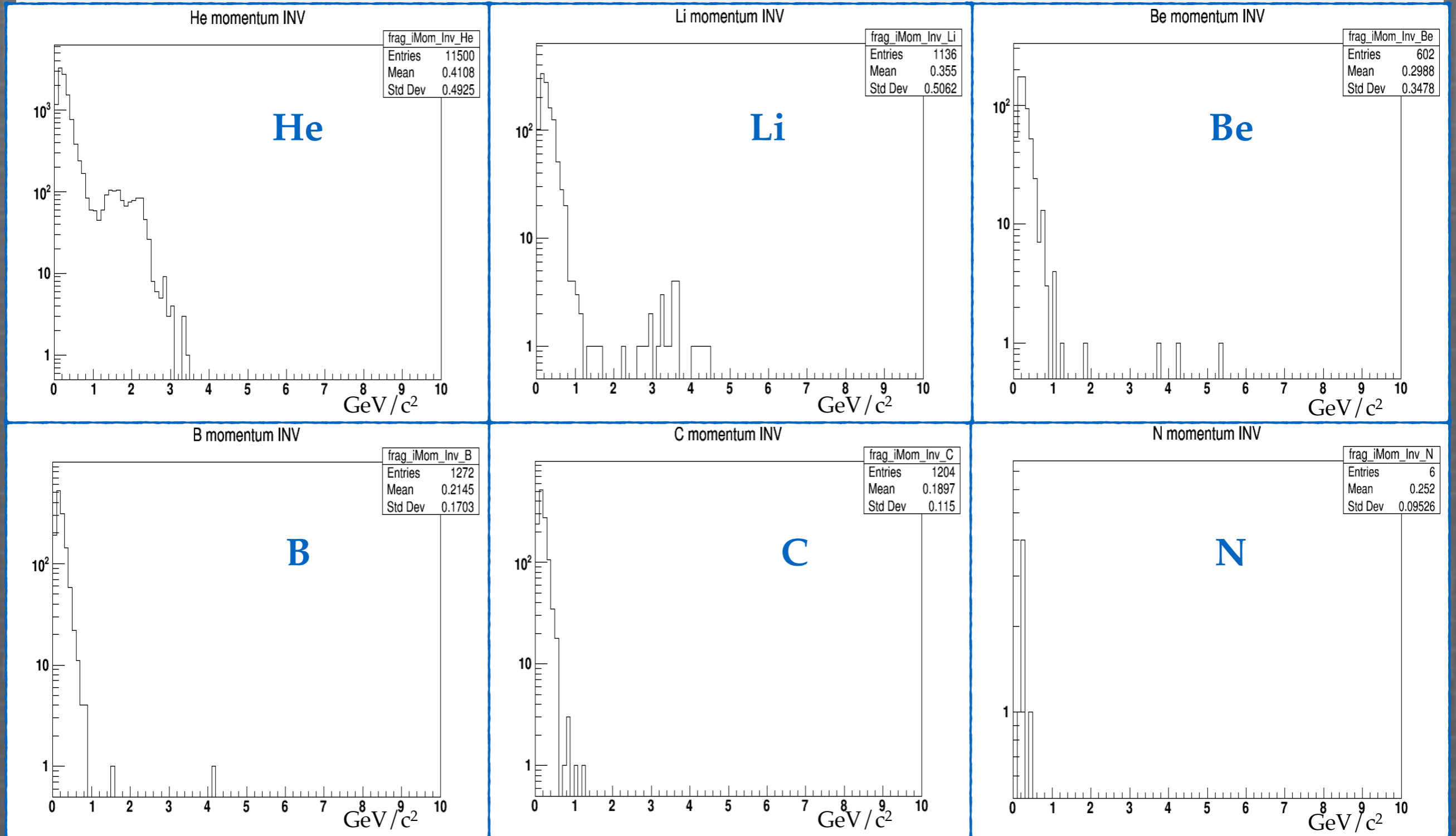


N kin energy/nucleon INV



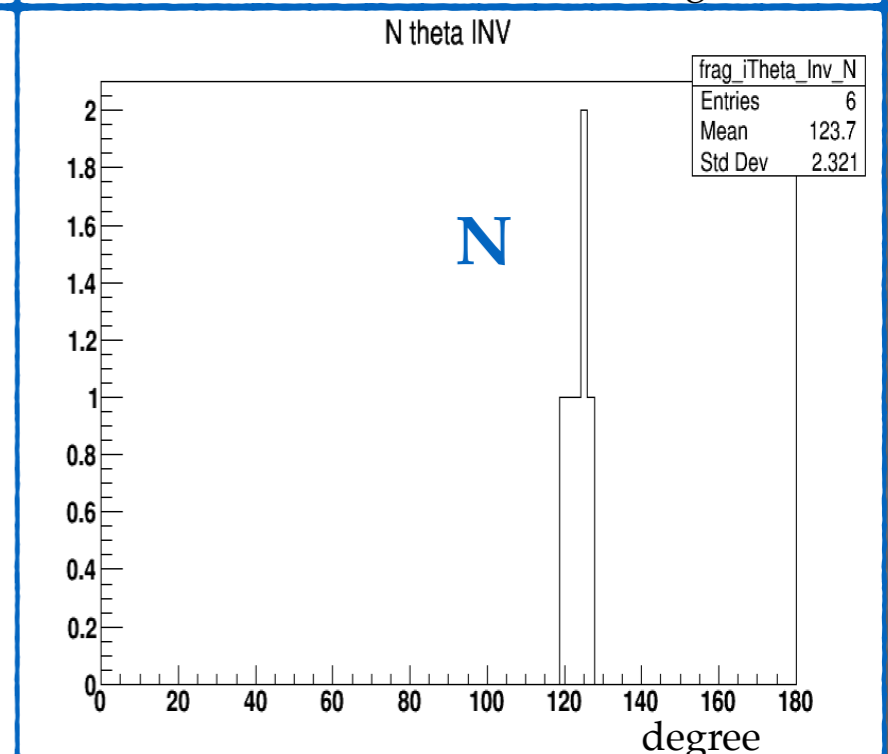
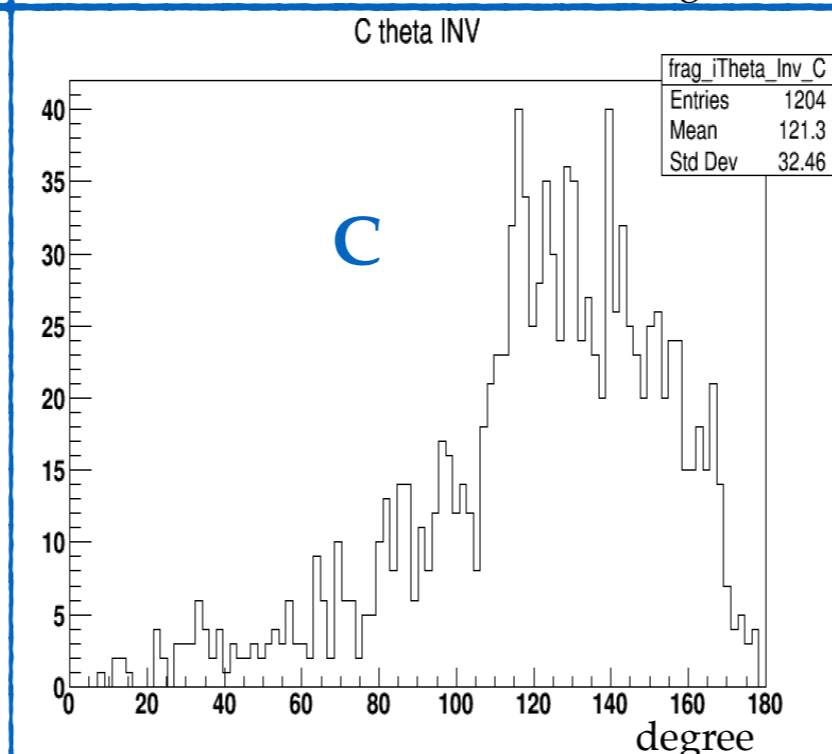
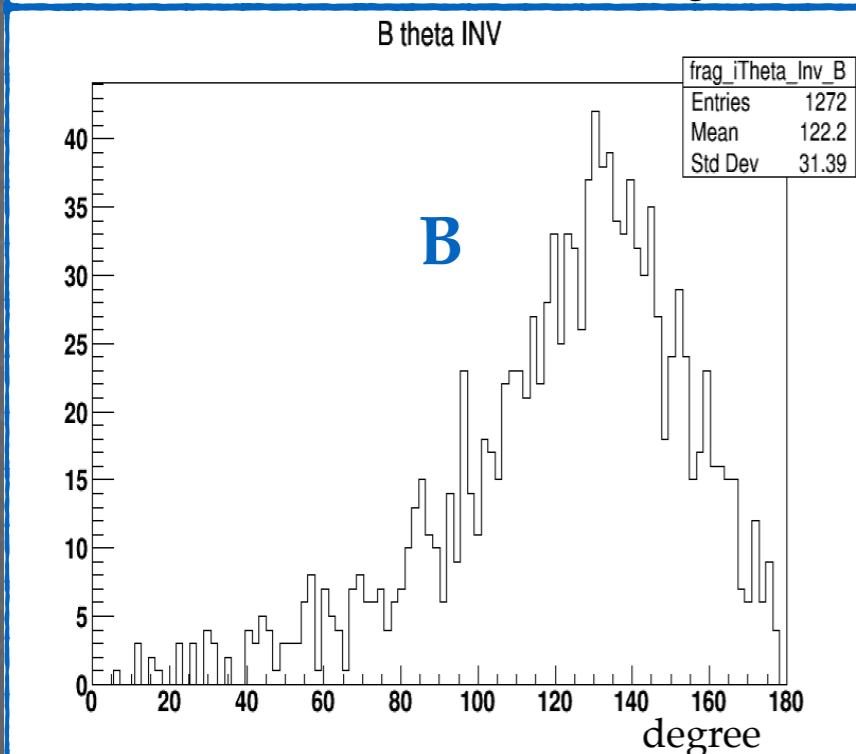
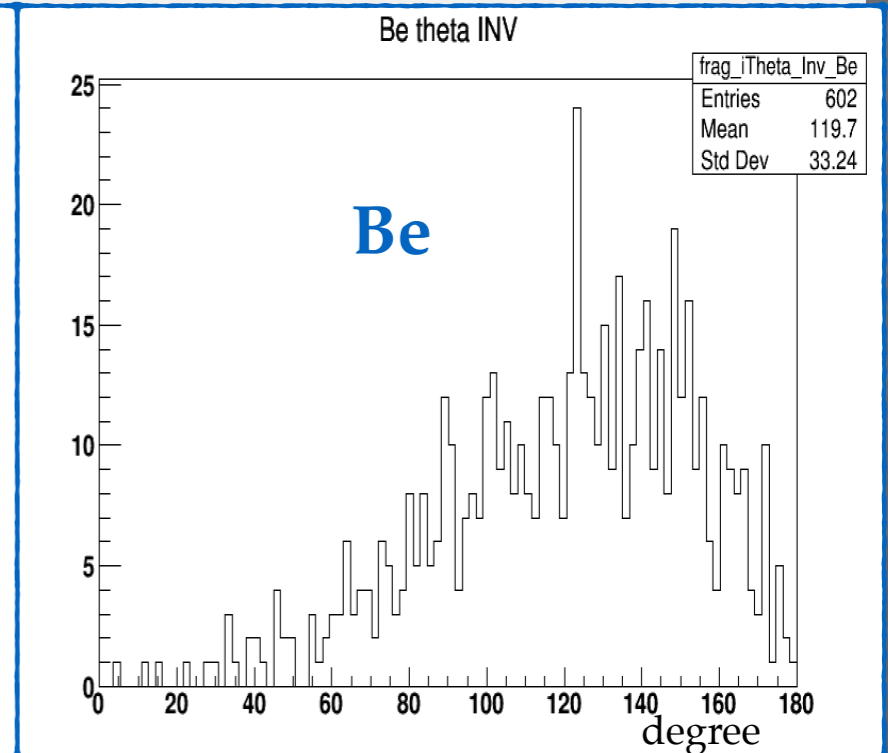
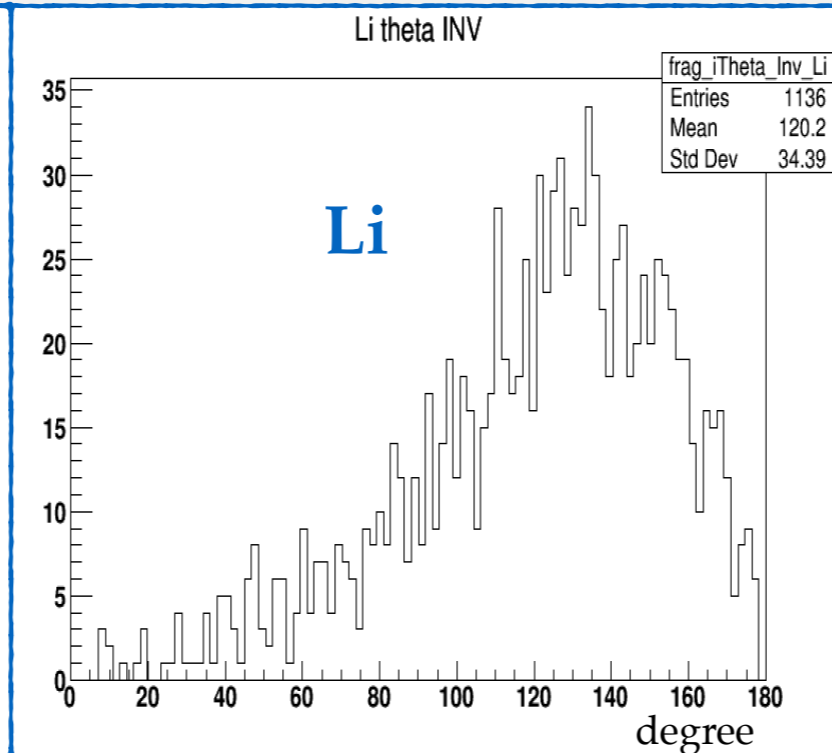
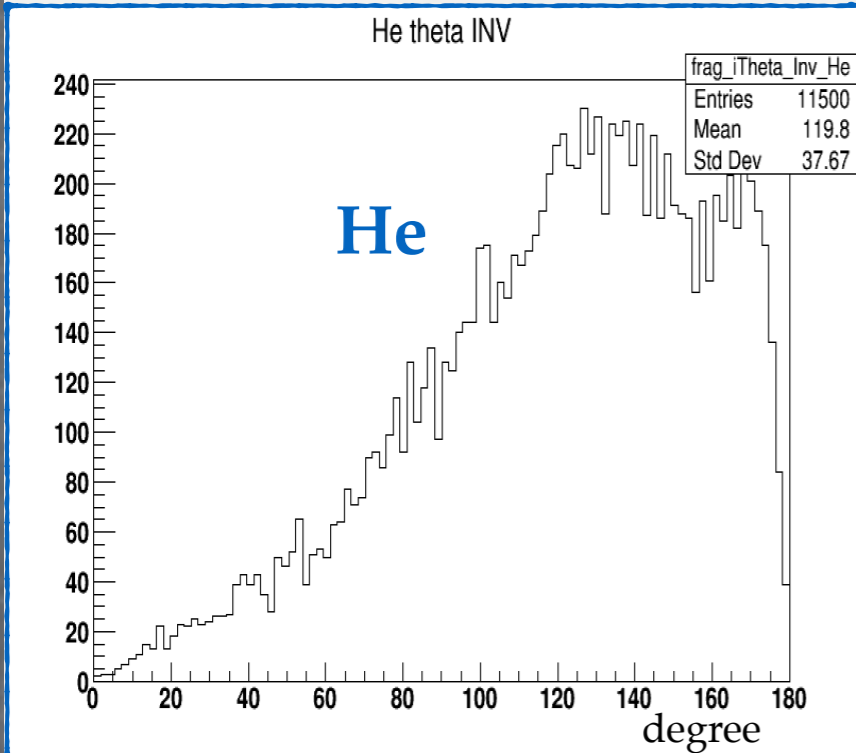
FIRST RESULTS

Momentum (INVERSE KINEMATICS)



FIRST RESULTS

Theta angle
(INVERSE KINEMATICS)



NEXT STEPS

- Evaluation of kinematical distributions of fragments produced in C-C interactions
- From kinematical distributions to cross-section measurement
- Introduction of smearing effect on measured quantities

BACKUP

FIRST RESULTS

Momentum (DIRECT KINEMATICS)

