

Update on Tracking Analysis

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Online Replay

- Follow-up to the last presentation.
- Looking at HMS tracking efficiencies.
- Using online 50k replay

SCRIPTS/SHMS/PRODUCTION/replay_production_hms_coin.C

- A quick comparison was done for the tracking efficiency using different algorithm.

Efficiency Calculation

- Efficiency is calculated in the Report files generated from template file located in

TEMPLATES/HMS/PRODUCTION/pstackana_production.template

- Following formula is used in by the template file for tracking efficiency calculation

$$\text{Hadron Efficiency} = \frac{\text{hmsScinDide.npassed}}{\text{hmsScinShoulde.npassed}}$$

DEF Files

- Following DEF-files are being used

DEF-files/HMS/PRODUCTION/pstackana_production.def

DEF-files/HMS/PRODUCTION/pstackana_production_cuts.def

- The algorithm selection was done in the PARAM file located in

PARAM/HMS/GEN/htracking.param

- Two different flags are available for two algorithms

hsel_using_scin

hsel_using_prune

HMS Electron Efficiencies

➤ Looked at production runs for HMS

Run Number	P , Angle	$\frac{3}{4}$ Trig Rate (KHz)	Efficiency (Offline)	Should Counts	Did Counts
6639	- 0.89, 21.14	189.41	99.91 ± 0.03	11524	11514
6640	- 0.89, 21.14	190.87	99.90 ± 0.03	11437	11426
6642	- 0.89, 21.14	86.95	99.95 ± 0.02	11012	11007
6645	- 0.89, 21.14	123.87	99.87 ± 0.03	11327	11312
6650	- 0.89, 21.14	131.03	99.89 ± 0.03	11129	11117

Outlook

- In comparison with SHMS, the calibrations are not making any difference for HMS tracking efficiency.
- The change in tracking algorithm was insignificant for the calculation of tracking efficiencies.
- A difference in rates was observed between CSV files and report files. The rates appear to be relatively low in CSV file.
- Need to investigate different rates and check their impact on the tracking efficiencies.

SHMS Hadron Efficiencies (Recall)

➤ Looked at production runs for SHMS

Run Number	P , Angle	Rate (KHz)	Efficiency (Online)	Efficiency (Offline)
6639	+2.583 , 6.79	537	95.85 ± 0.23	99.21 ± 0.10
6640	+2.583 , 6.79	530	95.98 ± 0.23	99.24 ± 0.10
6642	+2.583 , 6.79	221	98.17 ± 0.14	99.43 ± 0.08
6645	+2.583 , 6.79	476	97.59 ± 0.16	99.45 ± 0.08
6650	+2.583 , 6.79	340	97.19 ± 0.18	99.24 ± 0.10