

IO Track Studies

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Pulls
Rates

SiSA Rates

MC ($Z \rightarrow \mu\mu$):

- 39443 SiSA tracks
- 4573 central SiSA, 1128 form IO tracks

Data ($Z \rightarrow ee$):

- 59551 SiSA tracks
- 8377 central SiSA, 4519 form IO tracks

Duplicate Rates

Central (pass through entire COT)

- Without IO: 5/5271 (0.09%)
- With IO: 10/5276 (0.19%) (10 IO tracks)
- With IO, no duplicate removal: 37/5280 (0.70%) (41 IO tracks)

Small/negligible gain from central IO

Forward (does not pass through entire COT)

- Without IO: 0/1803 (0.00%)
- With IO: 0/2336 (0.00%) (533 IO tracks)
- With IO, no duplicate removal: 19/2347 (0.81%) (563 IO tracks)

Small/negligible duplicate rate from forward IO

Pulls

MC ($Z \rightarrow \mu\mu$):

Method	Curv. Pull	ϕ_0 Pull	d_0 Pull	$\cot \theta$ Pull
IO	1.9	1.7	1.9	1.3
OI	1.2	1.4	1.6	1.0
COT	0.8	1.4	1.3	1.2

Data ($Z \rightarrow \mu\mu$): d_0 pull: 1.32 (IO), 1.15 (OI), 1.14 (COT)

Wrong hits

- COT hits: IO tracks, 1.75%, COT tracks, 0.45%
- Si hits: IO tracks, 0.77%

Summary

Central SiSA/IO adds little efficiency – could remove?

IO pulls worse – SiSA has higher wrong-hit rate?