NOV 20TH 2026

REPORT FROM THE DATA-MC MATCHING WORKFEST

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WHAT WERE THE OBJECTIVES AND WHAT WE DID

- Objectives:
  - Identify data-mc mismatch/good matches
  - Diagnosing them: which problems are known, which remain to be explored
  - Overview of ongoing work, centralizing information
- Contributions:
  - Specific effects (smearing, efficiency, digitization, calibrations…)
  - Specific subsystems (RICH, DCs, FT,…)
  - A couple slides, preliminary or ongoing work welcome
  - Open discussion

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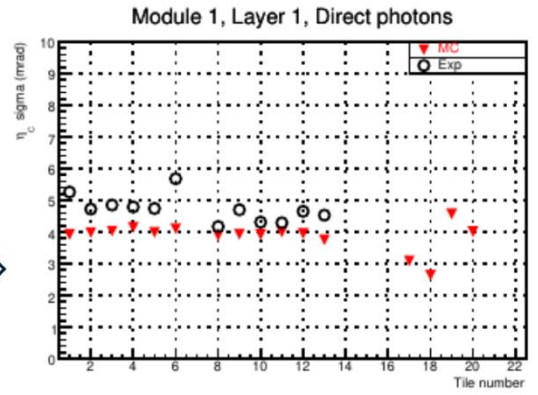
RICH

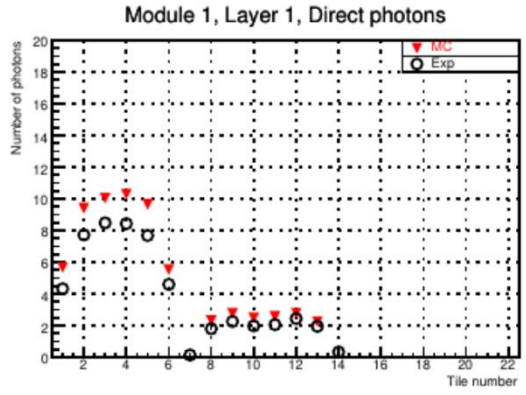
Marco Mirazita

- Trajectories-clusters matching, Cherenkov angle resolution, photon yields
- To be explored:
  - Calibration constants in digitization
  - Background merging
  - Effect of DC resolution

0 reflections

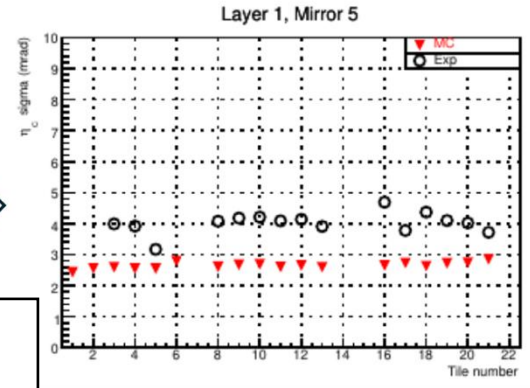


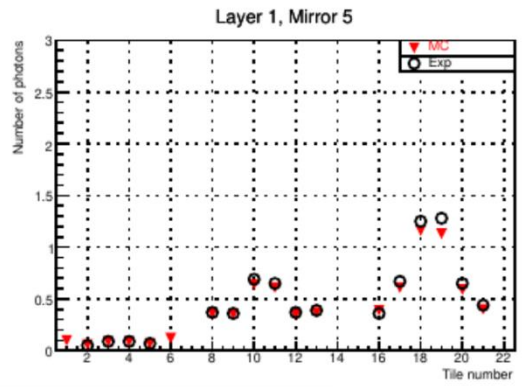
Cherenkov angle resolution



Number of photons per track

2 reflections





RGA comparisons

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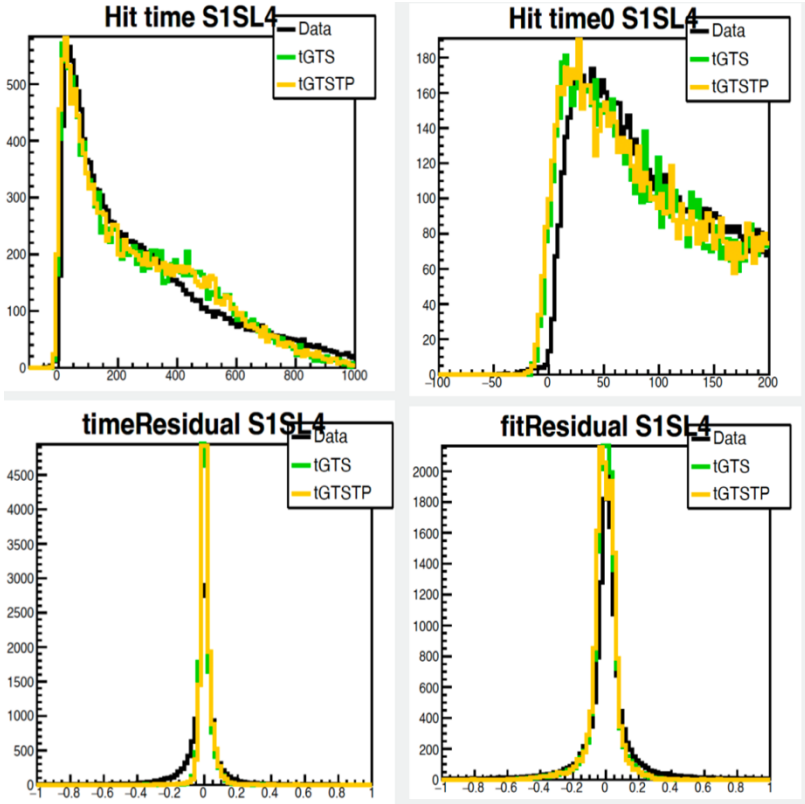
DC

- Known mismatches in efficiencies and smearing
- Summary of 2024 work (M. Tenorio Pita) with digitization tuning:
  - adding all time terms
  - smearing of hits time



Run 5700
No Background
Time Smeared by Gauss

Green: With TStart
Yellow: With TStart and TProp

M. Tenorio Pita

Ongoing work:

Florian Hauenstein

- Real run numbers
- Inefficiencies for different high voltage settings
- Calibrating MC
- Pressure dependence of T2D

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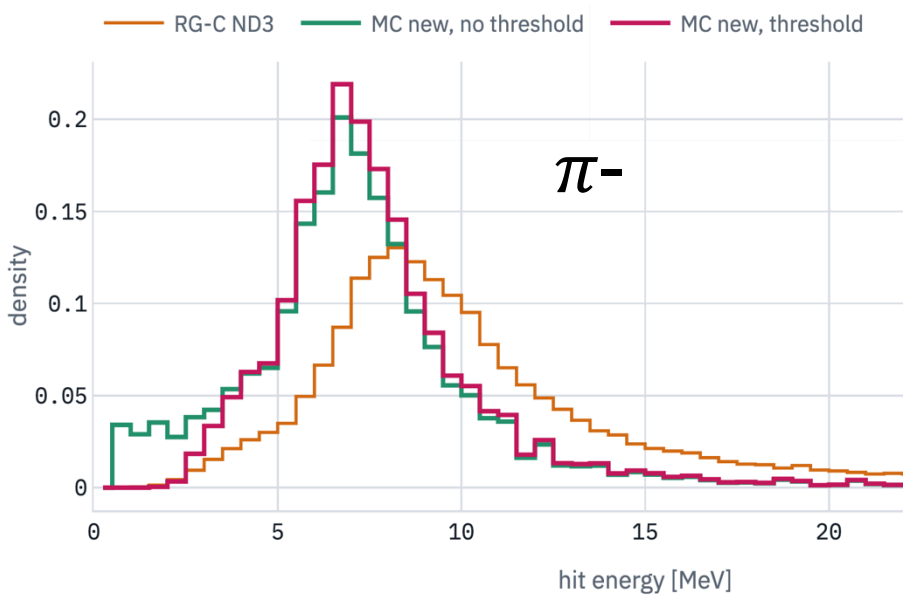
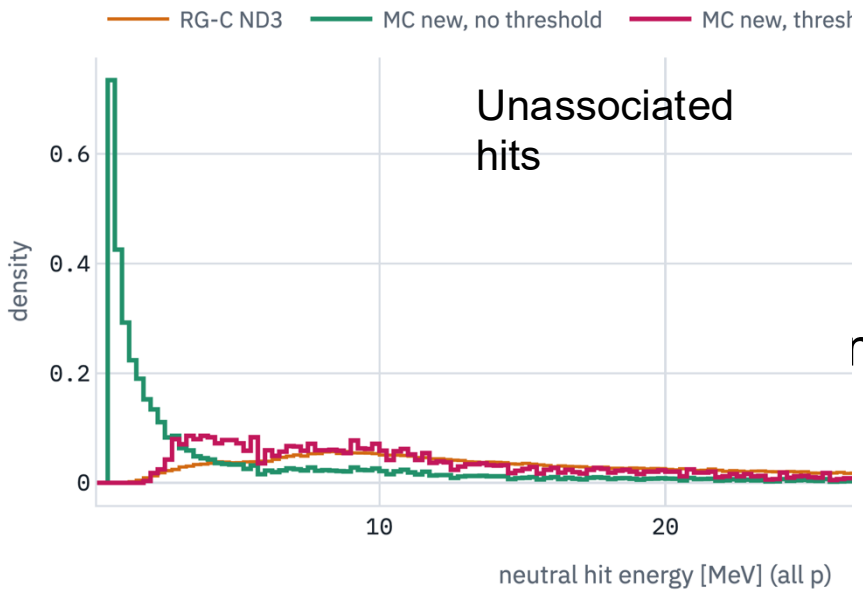
CND

- Mismatches in hit energy deposition:
  - Lacking thresholds
  - Offset in MIP peaks
- Calibration constants from a real run
  → better ADC distribution match

- Decided on a plan to implement thresholds at ADC level in gemc
- MIP peak mismatch to be explored calibrating MC run





mie Pilleux

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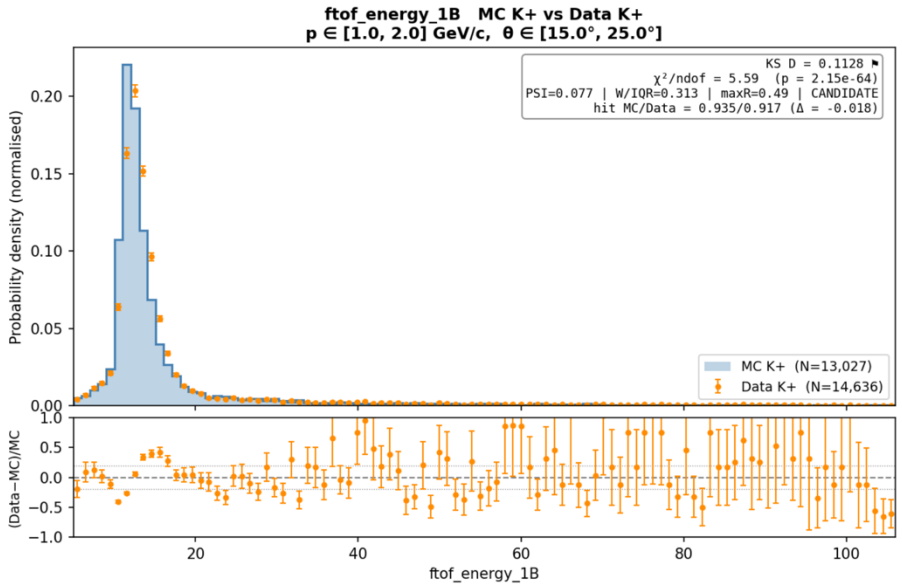
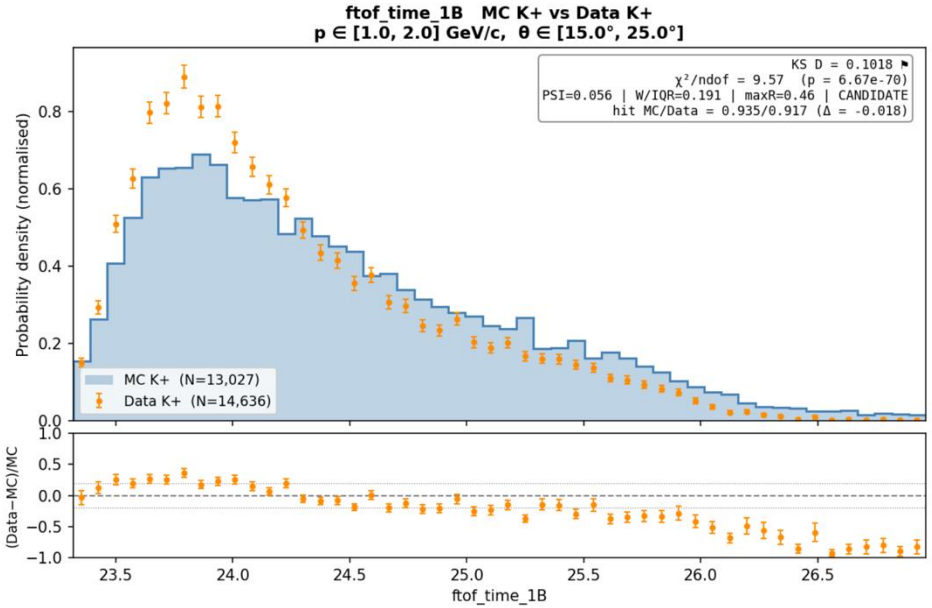
FD CAL

- Complete review of relevant quantities (energy deposits, timing, in kinematic bins, with particle selection,…)
- Generalized to other subsystems?
- To be discussed at CALCOM: are calibration constants for MC realistic?





Maria Žurek, Cooper Bell

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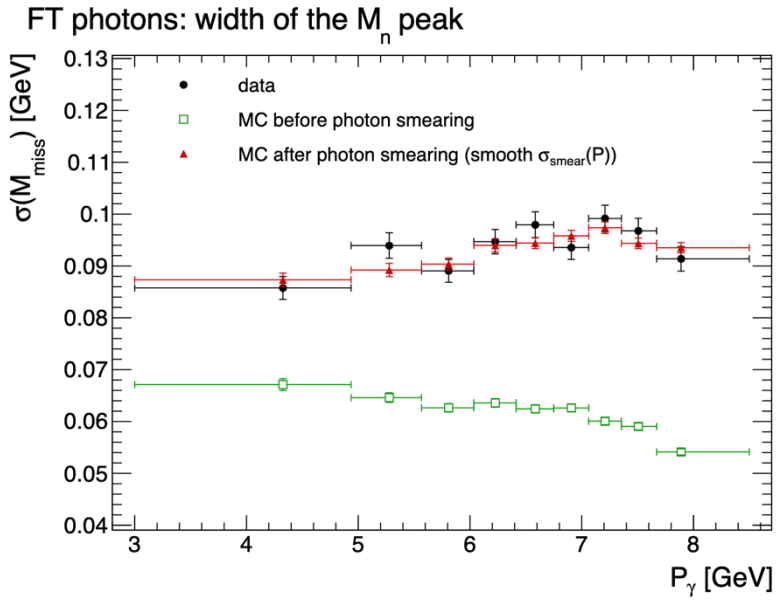
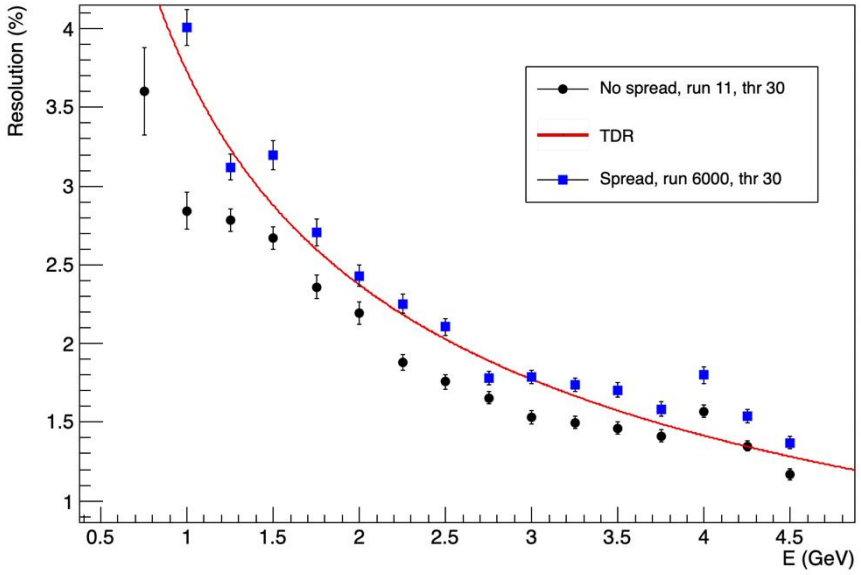
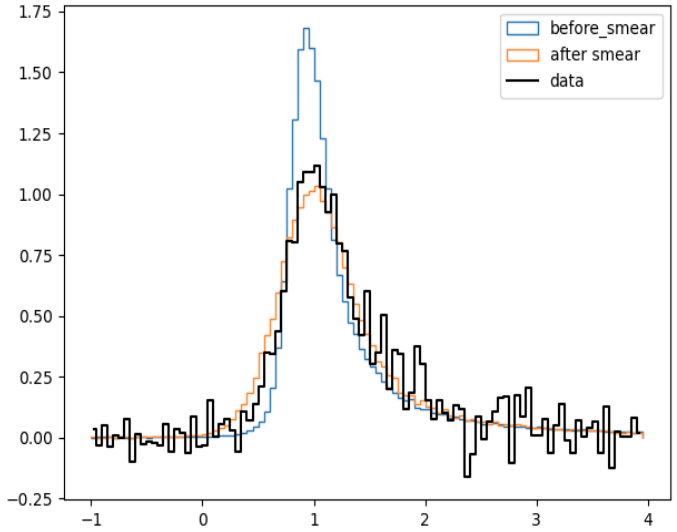
FT

- Photon energy smearing 1.3 – 2%
- Understood, can be fixed for recent run groups:
  - Npe smearing in the digitization
  - Realistic smear in calibration constants
- Older run groups need smearing:
  - Add a module in iguana
  - Share a script to extract smearing from pi0 decays, missing masses,..







Elouan Ferrand, Noémie Pilleux, Marco Spreafico

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FUTURE STEPS

- General
  - Have a set of real run constants in run 11? To be discussed with subsystem experts, CALCOM
  - Big sample of CLASDIS will be available: showing data/MC in all relevant quantities and systems, closure tests

- Continuing the effort:
  - Repository for the workfest with relevant material and scripts (ongoing): [here]
  - Objectives for a future meeting → January?
  - Workfest to be carried at future collaboration meetings?
  - Input from subsystems not addressed this time: HTCC, LTCC, CVT, CTOF

- **Thanks to everyone who participated!**

	Identified mismatch	Near term solutions/exploration

FT	Photon energy	• Fix digitization and implement calibration errors (Marco S, Raffaella)
		• For datasets with older gemc version, smearing is needed. -
		  • Smearing in iguana (Noémie, Elouan)
		  • Run group dependence: share scripts to extract smearing from exclusive quantities (Noémie, Elouan)

FD calo	pcal times, energy deposits	• Are constants closer to real data needed? Bring the complete diagnosis (Maria) to CALCOM
DCs	Efficiency and smearing	• Updating inefficiencies for all datasets (Florian) • Fixes in digitization • Explore beyond intrinsic resolutions, smearing
RICH	cherenkov angles	• Calibration constants in digitization (Marco M) • Comparing with truth and comparisons between run groups to understand DC resolution impact
CND	Energy thresholds, offset in MIP peaks	• Calibrating the MC to diagnose the shift in MIP (Silvia, Noémie) • Thresholds in gemc (Maurizio, Noémie) • Constants from a real run for run 11

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