Backward Hadronic Calorimeter update

Acceptance study

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ePIC Calorimetry meeting 18.9.2024

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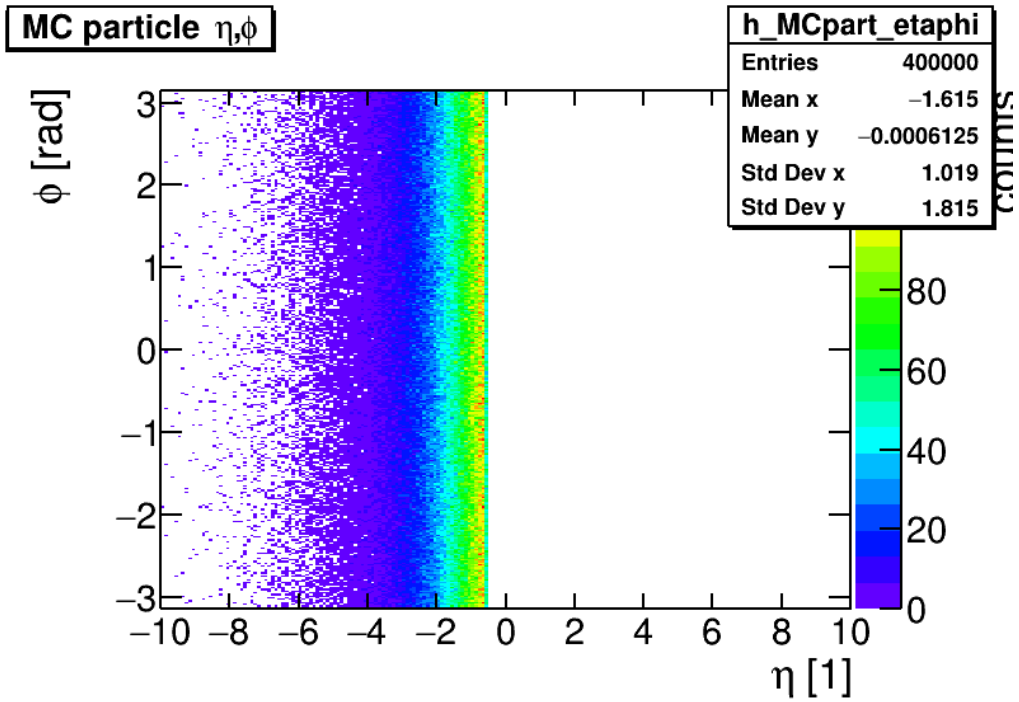
Outline

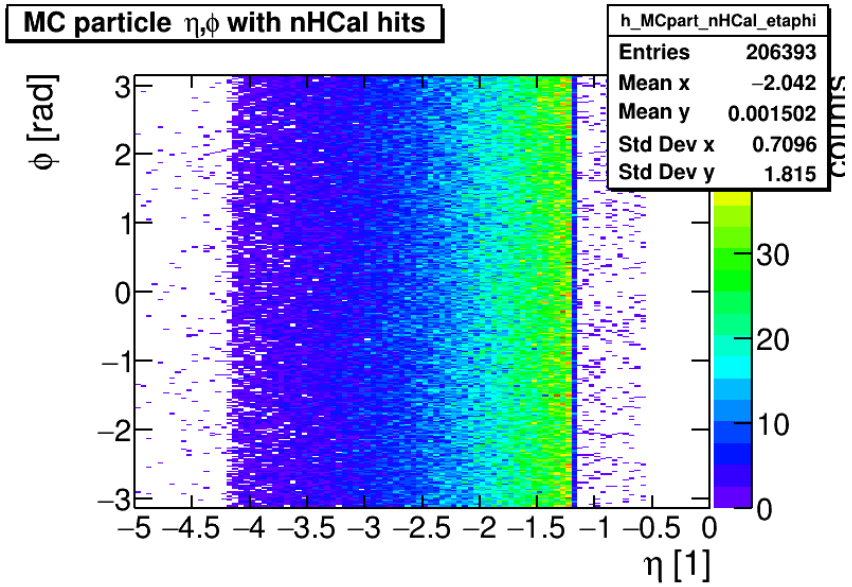
Simulated MCparticle η, ϕ



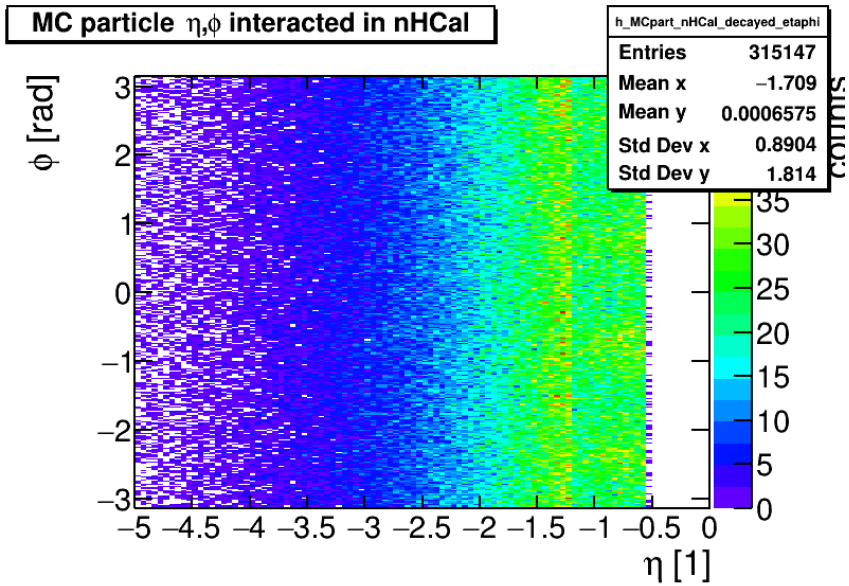
- nHCal only geometry used (no collar, oculus, flux return) to study geometric acceptance
- avoids secondaries created in the material in front
- Shooting single π^- only in $180 < \theta < 120\,\text{deg}$ at kinetic energy $E = 1, 2, 3\,\text{GeV}$
- Looked at primary π^- only

Acceptance study π^- $E = 1\,\mathrm{GeV}$

MCparticles with hit contributions in nHCal



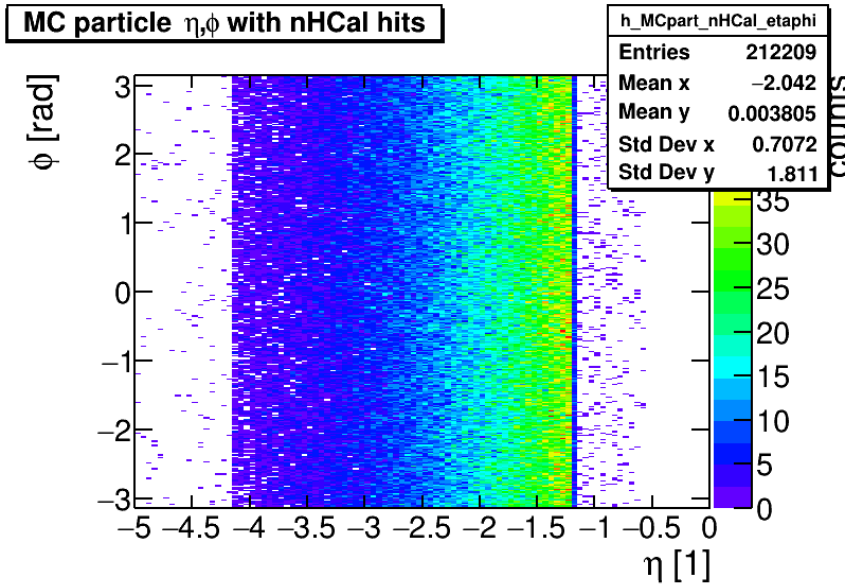
MCparticles isDecayedInCalorimeter==true



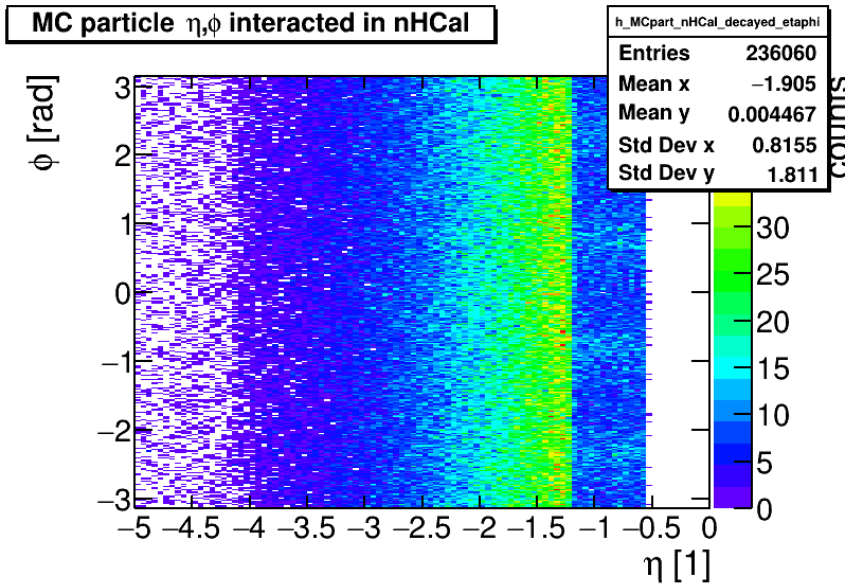
- nHCal only geometry used (no collar, oculus, flux return) to study geometric acceptance
- avoids secondaries created in the material in front
- π^- $E = 1\,\mathrm{GeV}$
- Acceptance $-4.16 < \eta < -1.16$
- Ignored scattered points, because of interactions with air
- Checked isDecayedInCalorimeter==true does not make sense and is probably buggy

Acceptance study π^- $E = 5\,\mathrm{GeV}$

MCparticles with hit contributions in nHCal



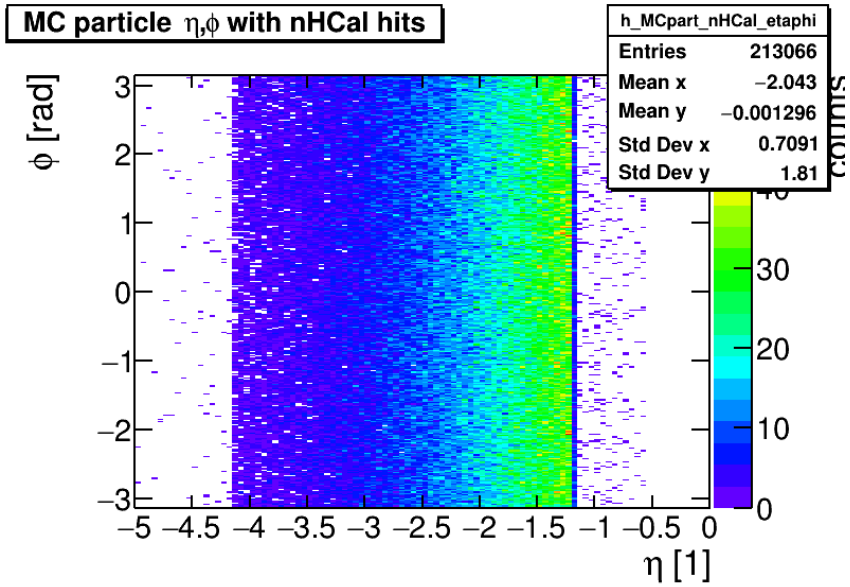
MCparticles isDecayedInCalorimeter==true



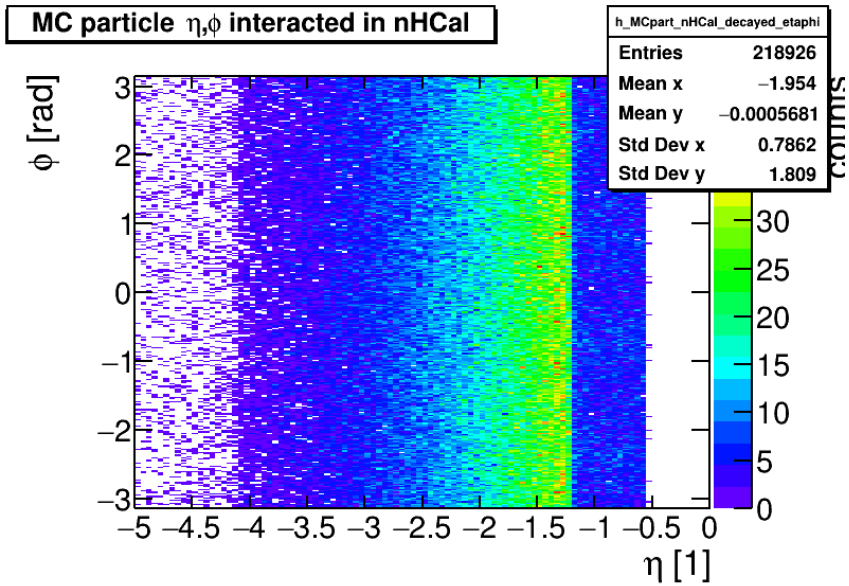
- nHCal only geometry used (no collar, oculus, flux return) to study geometric acceptance
- avoids secondaries created in the material in front
- π^- $E = 5\,\mathrm{GeV}$
- Acceptance $-4.14 < \eta < -1.16$
- Ignored scattered points, because of interactions with air
- Checked isDecayedInCalorimeter==true does not make sense and is probably buggy

Acceptance study π^- $E = 10\,\mathrm{GeV}$

MCparticles with hit contributions in nHCal

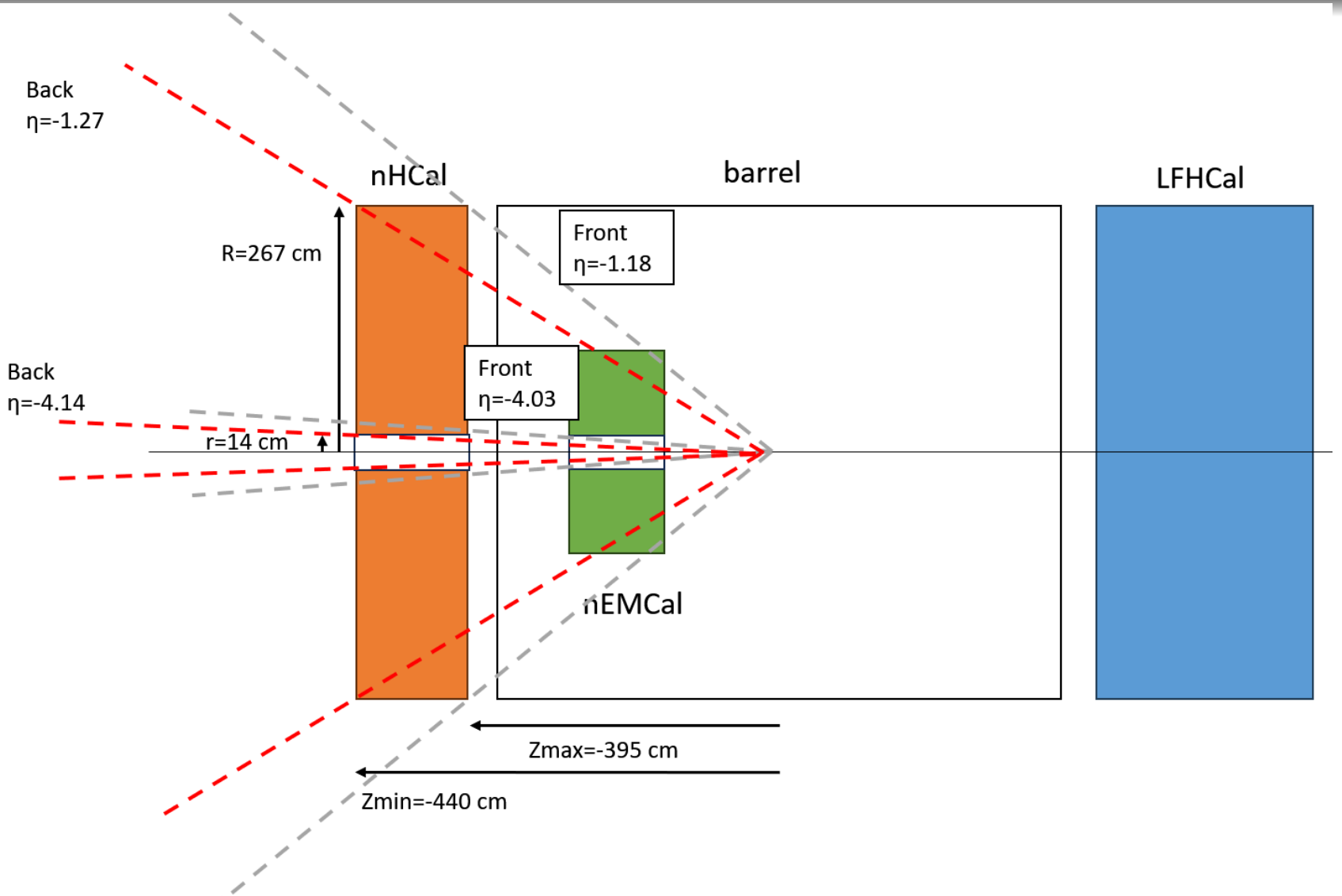


MCparticles isDecayedInCalorimeter==true



- nHCal only geometry used (no collar, oculus, flux return) to study geometric acceptance
- avoids secondaries created in the material in front
- π^- $E = 10\,\mathrm{GeV}$
- Acceptance $-4.12 < \eta < -1.16$
- Ignored scattered points, because of interactions with air
- Checked isDecayedInCalorimeter==true does not make sense and is probably buggy

Acceptance from geometry



- Acceptance calculated based on the geometry dimensions
  - Front geometry limit: $-4.03 < \eta < -1.18$
  - Back geometry limit: $-4.14 < \eta < -1.27$
  - Clusters: $-3.95 < \eta < -1.25$

Summary

Conclusions

- Hit contributions give reasonable value
- Acceptance $-4.16 < \eta < -1.16$
- Checked isDecayedInCalorimeter==true is probably buggy

BACKUP