

Updates on runtimes



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Workstation

- CPU: AMD Ryzen Threadripper 3960X 24-Core Processor
Base clock speed: 2.2GHz
Max clock speed: 3.8GHz
L3 cache: 64 MB
- RAM memory: 64 GB

Simulations information

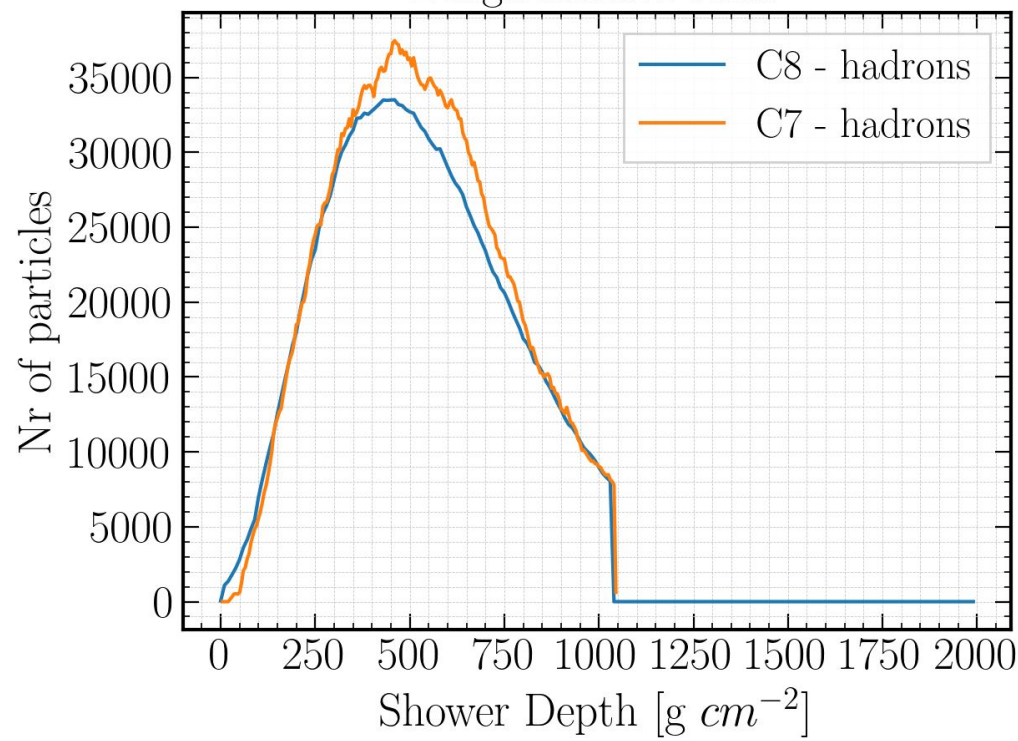
- **testing-branch-May23** – corsika.cpp (modified version that includes radio)
- **C8**: PROPOSAL 7.5.1, FLUKA, SOPHIA, SIBYLL, thinning (fixed) + stochastic photon MR
- **em cuts** = 500keV — **hadron cuts** = **muon cuts** = 0.3GeV
- **primary particle** = iron
- **C7**: QGSJET-II.04, URQMD (FLUKA crashed during run)

10PeV iron showers

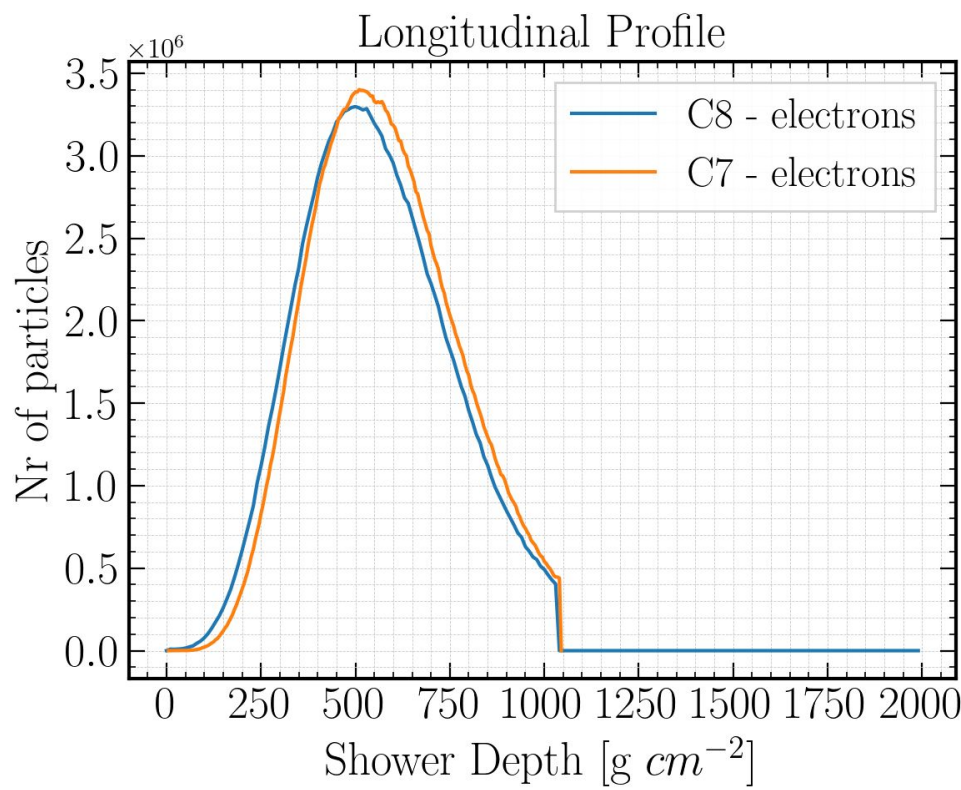
- thinning: $\varepsilon=1e-5$, max weight = $1e2$
- 0 antennas
 - C7 = 3m13,490s — C8 = 41m48,927s
- 16 antennas
 - C7 = 7m24,873s — C8 = 1h9m17,565s
 - change maxRad = **0.01** (C8 value) to **0.2** (C7 value) the runtime is 57m38,535s and for **0.1** runtime is 56m17.477s
 - number to radio calls (measure of the number of tracks)
 - C7 is 194750970 calls
 - C8 (**0.2** rad) is 106294549 calls
 - C8 (**0.01** rad) is 161644775 calls
 - C8 (**0.1** rad) is 108566295 calls

10PeV iron showers

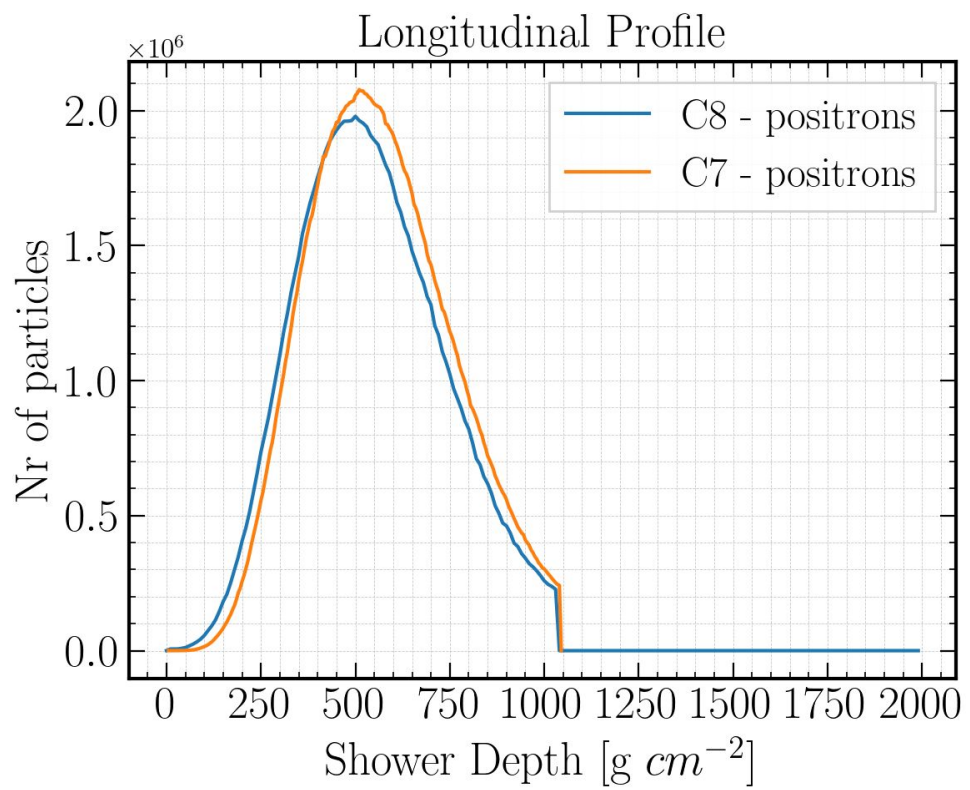
Longitudinal Profile



10PeV iron showers



10PeV iron showers

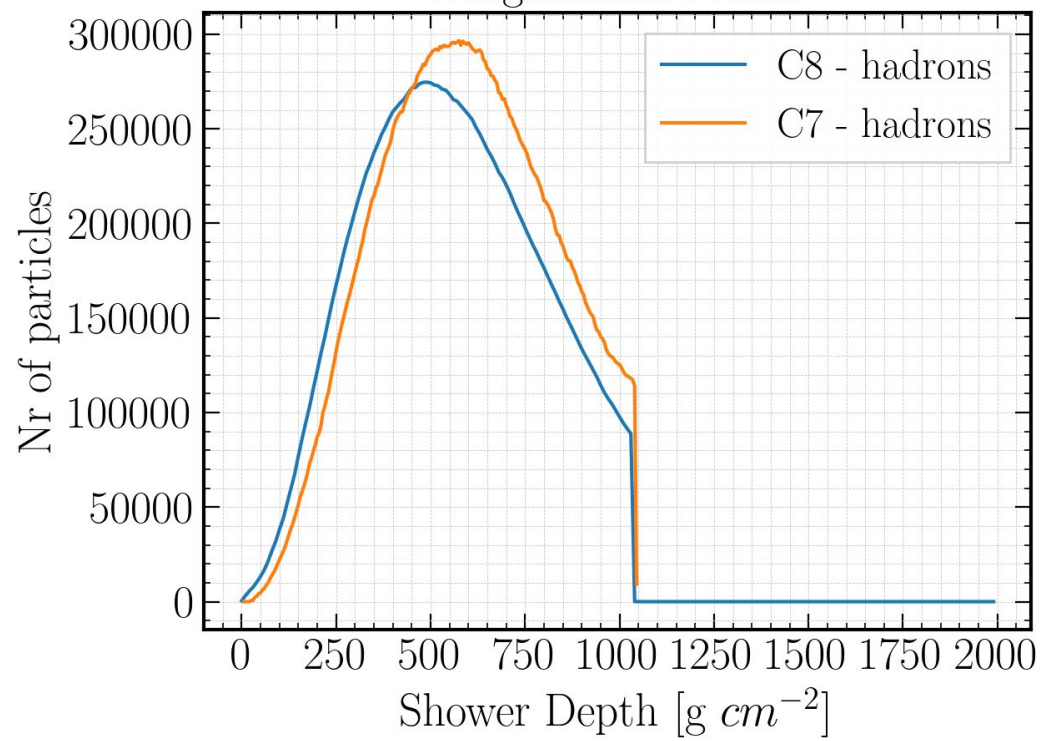


100PeV iron showers

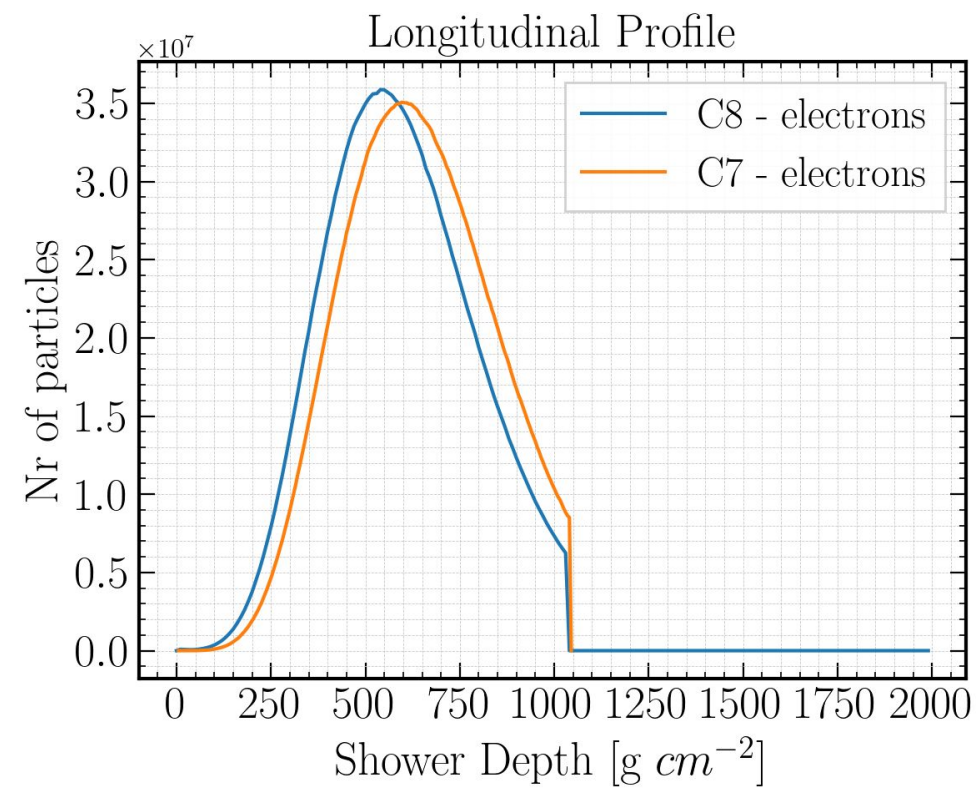
- **thinning:** $\varepsilon=1e-6$, max weight = $1e2$
- **0 antennas**
 - C7 = 32m53,319s — C8 = 6h50m3,556s
- **16 antennas**
 - C7 = 55m51,718s — C8 = 12h12m28,164s
- **thinning:** $\varepsilon=1e-1$, max weight = $1e7$ – radio off
 - C7 = 6,035s — C8 = 2h43m27,765s

100PeV iron showers

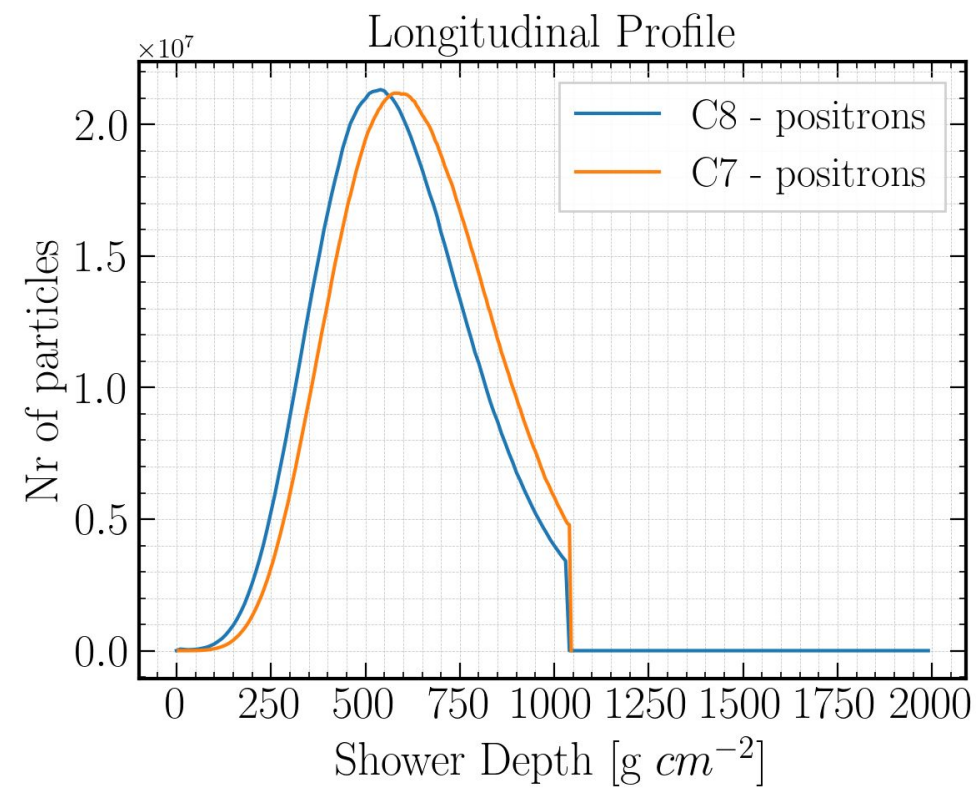
Longitudinal Profile



100PeV iron showers

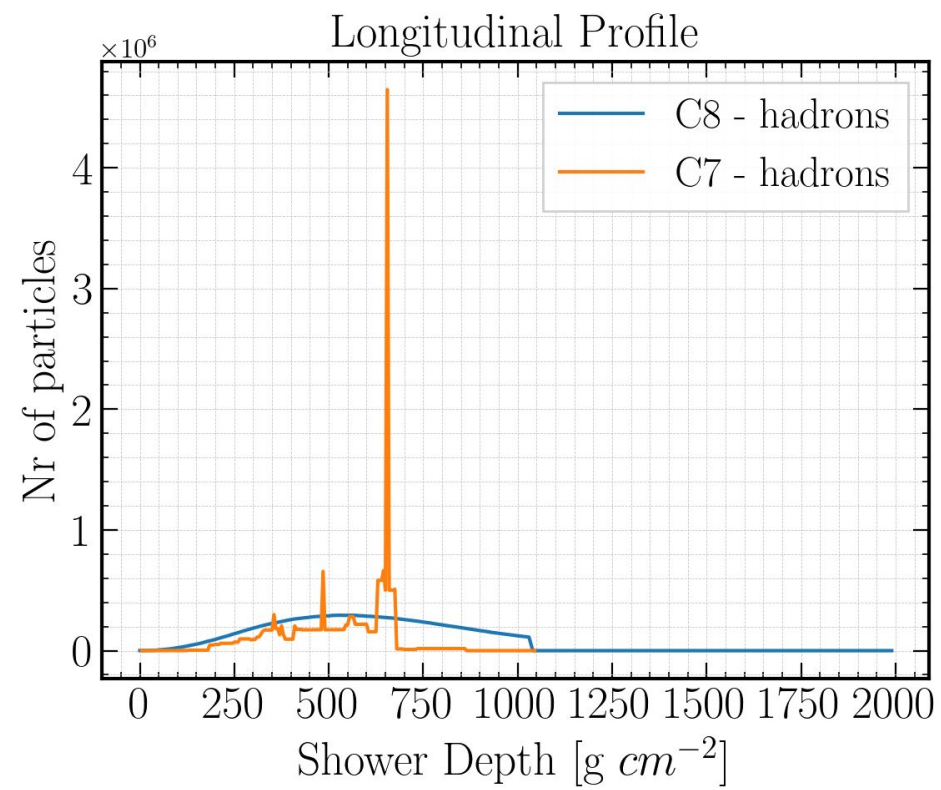


100PeV iron showers



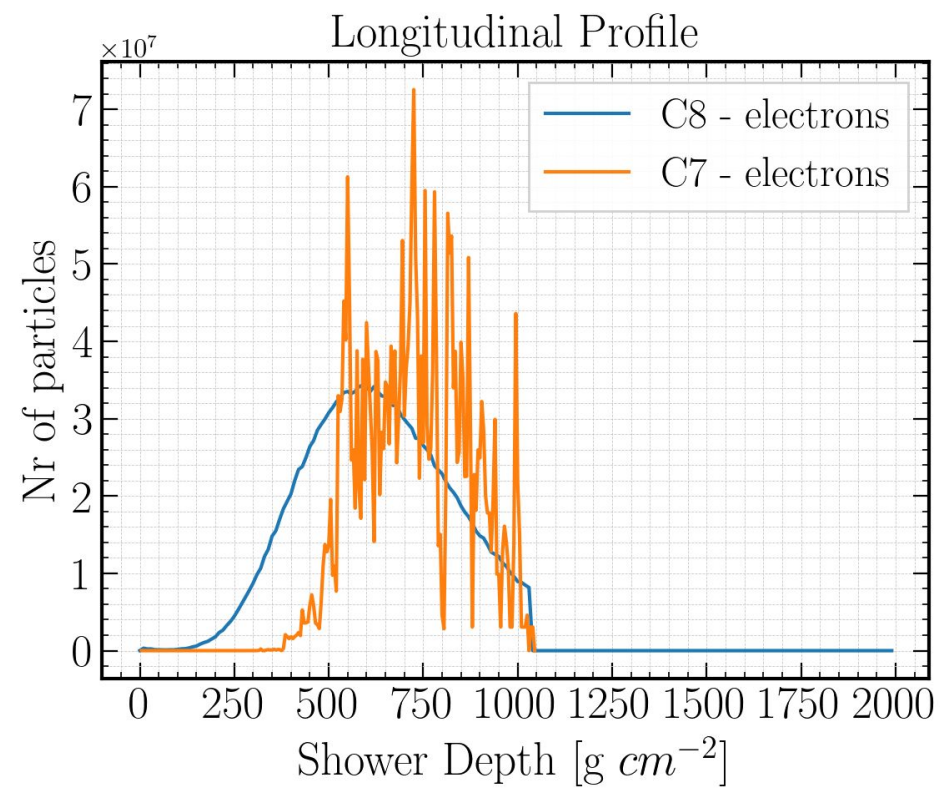
100PeV iron showers

$\epsilon = 1e-1$ - thinning



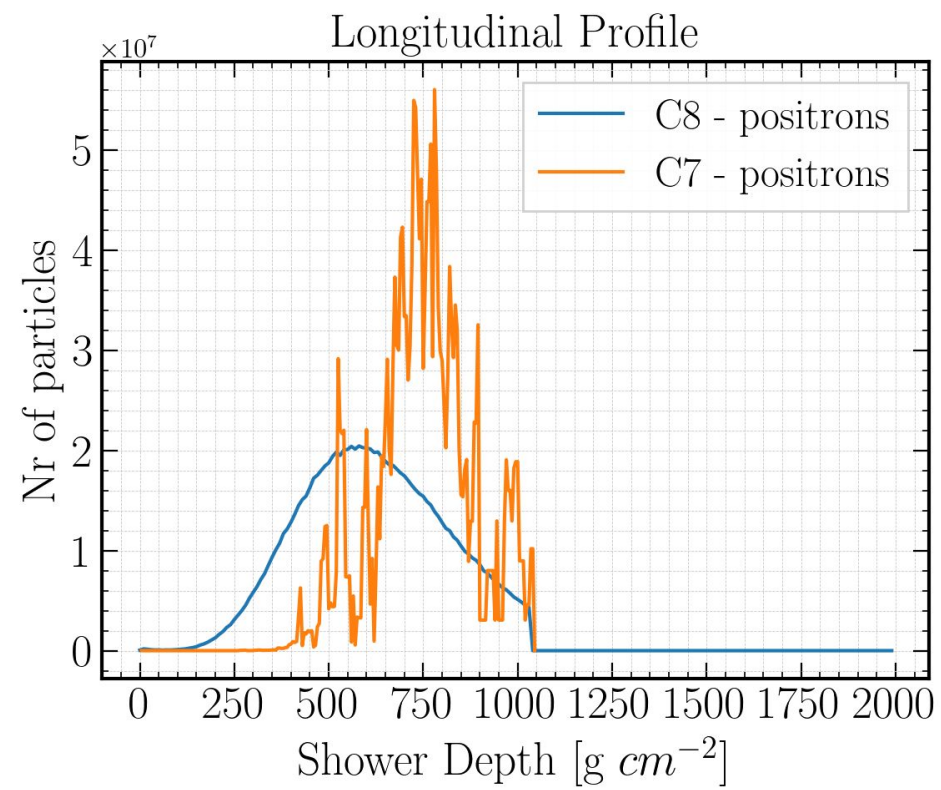
100PeV iron showers

$\epsilon = 1e-1$ – thinning



100PeV iron showers

$\epsilon = 1e-1$ – thinning



100PeV proton showers (200)

mean/min std.dev/min

=== EPOS-LHC ===

C7	25.4	1.29
C8	343	24.4

=== QGSJet-II.04 ===

C7	19.4	0.95
C8	237	22.6

=== SIBYLL 2.3d ===

C7	18.3	1.23
C8	237	15.8

Thank you!

Schlosspark - Karlsruhe

