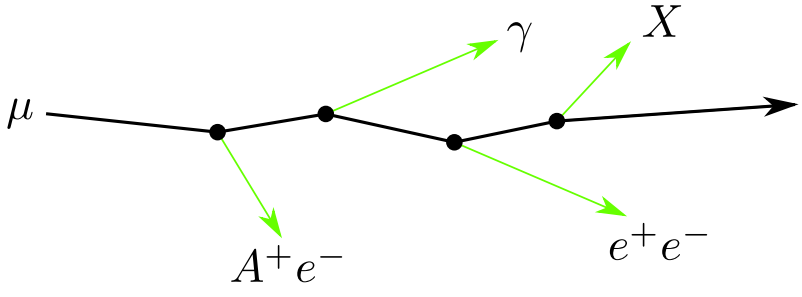
technische universität
dortmund



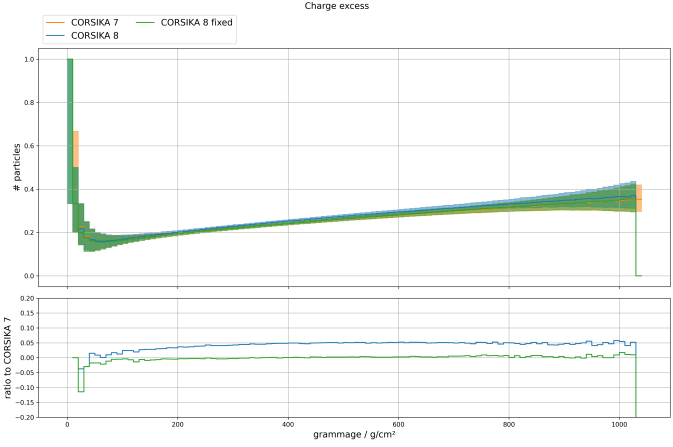
CORSIKA 8 technical call

Jean-Marco Alameddine, Alexander Sandrock

2023-04-13

- We found a mistake in the assigment of ionization cross sections to electrons and positrons within PROPOSAL
  - → Trivial fix in PROPOSAL
  - → Differences in cross sections are small, but relevant for the charge excess of low-energy particles
  - → No significant influence on longitudinal profiles of combined charged particles or photons

- Simulation of **10** TeV EM showers, cut at **0.5** MeV, statistics of 5000 showers. **Charge excess.**

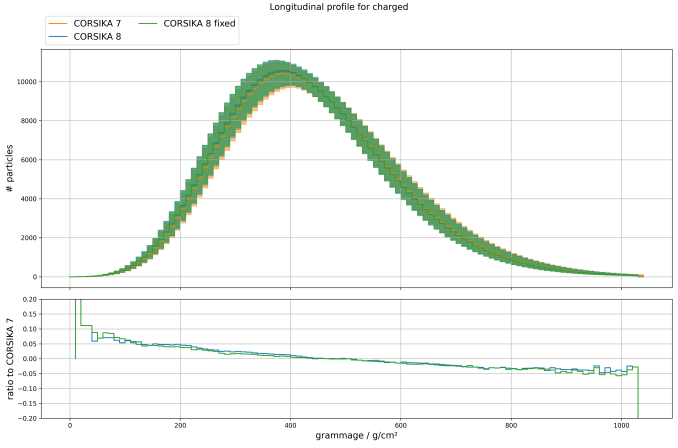


⇒ Significant improvement for longitudinal charge excess

- Fix will be included in next release of PROPOSAL (`v7.5.2` or `v7.6.0`)
  - → PR in conan has been approved, so new PROPOSAL releases can be distributed via conan soon
  - → This also means we can use CORSIKA 8 with conan2 soon
  - → When we use the new PROPOSAL version, this also allows us to continue merging other open PR in CORSIKA (!451, !471)

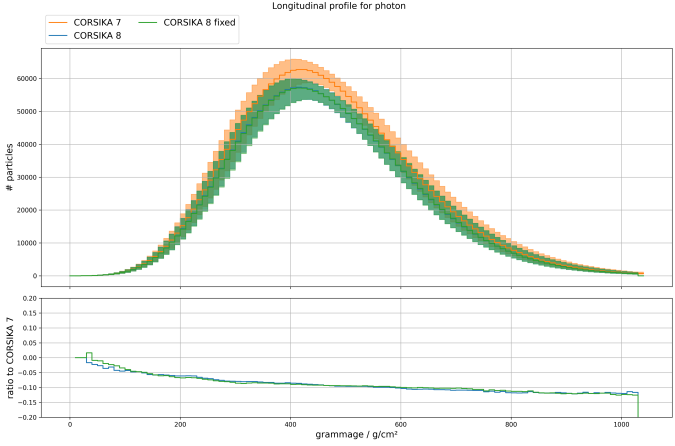
Backup slides

- Simulation of **10** TeV EM showers, cut at **0.5** MeV, statistics of 5000 showers. **All charged particles.**



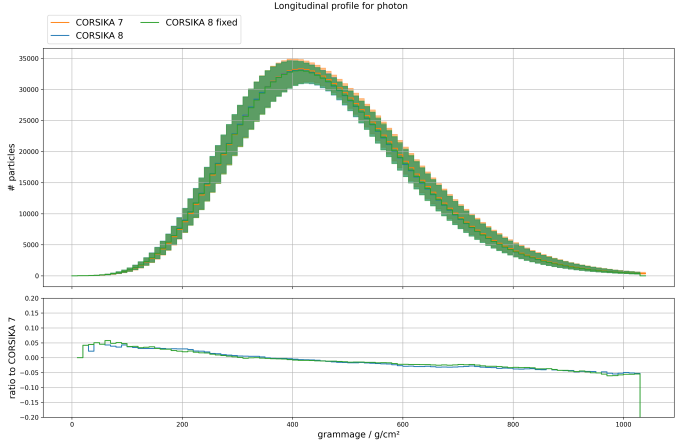
⇒ No significant changes in longitudinal profiles

- Simulation of **10** TeV EM showers, cut at **0.5** MeV, statistics of 5000 showers. **All photons.**



⇒ No significant changes in longitudinal profiles

- Simulation of **10** TeV EM showers, cut at **0.5** MeV, statistics of 5000 showers. **Only photons above 5 MeV**



⇒ For higher energies, displacement in photon profile follows displacement in charged particle profiles

- Difference between electron and positron energy losses for ionization