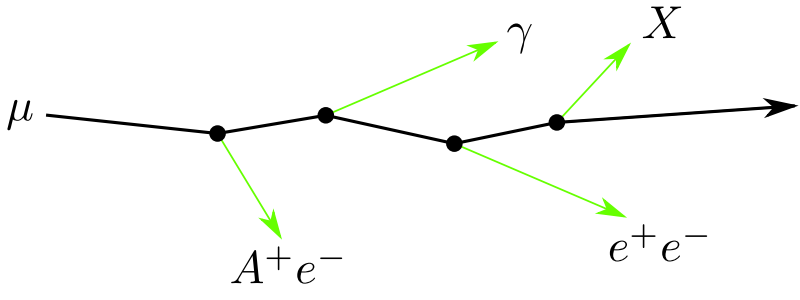
technische universität
dortmund

SFB1491

SFB 876 Providing
Information by Resource-
Constrained Data Analysis



PROPOSAL 7.4.2 for CORSIKA 8

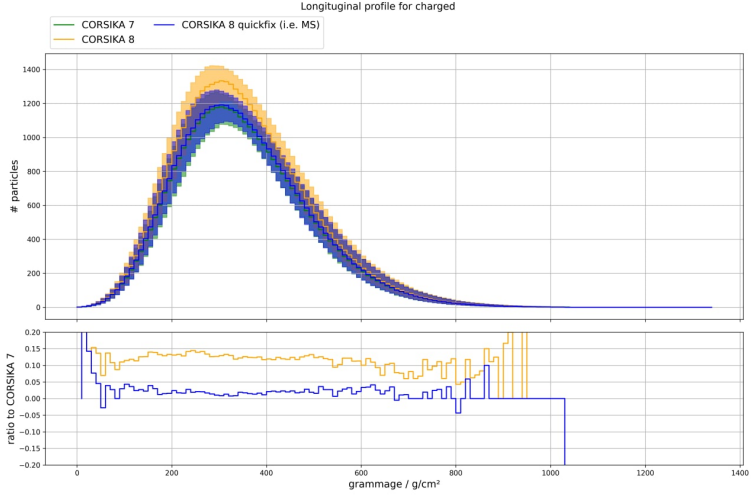
Jean-Marco Alameddine

2022-09-29

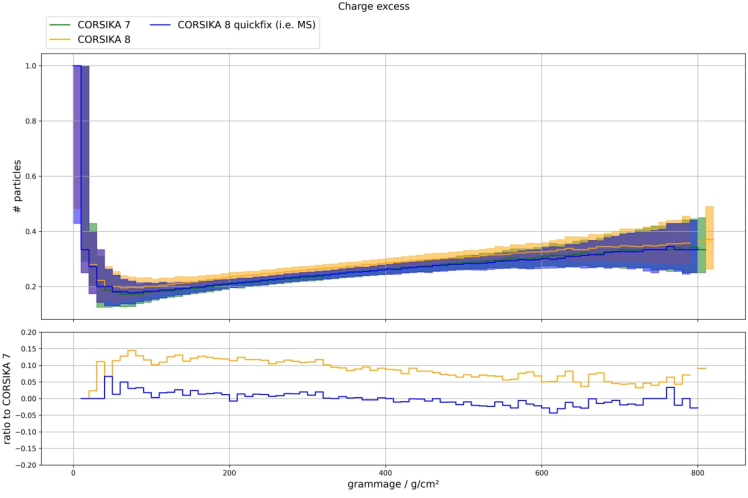
PROPOSAL version 7.4.2

- Merged PR 445 two days ago: Updates PROPOSAL version from `v7.3.1` to `v7.4.2` 🎉
- Summary of the updates (see presentation from 8 Sep by Alexander for a detailed review):
  - → Photoeffect as a new process
  - → Bugfixes for bremsstrahlung crosssection
  - → Significant runtime improvement (20 %)
  - → Logging information about table creation of PROPOSAL
- Major improvement from a practical point of view: Possibility to simulate particles to lower energies

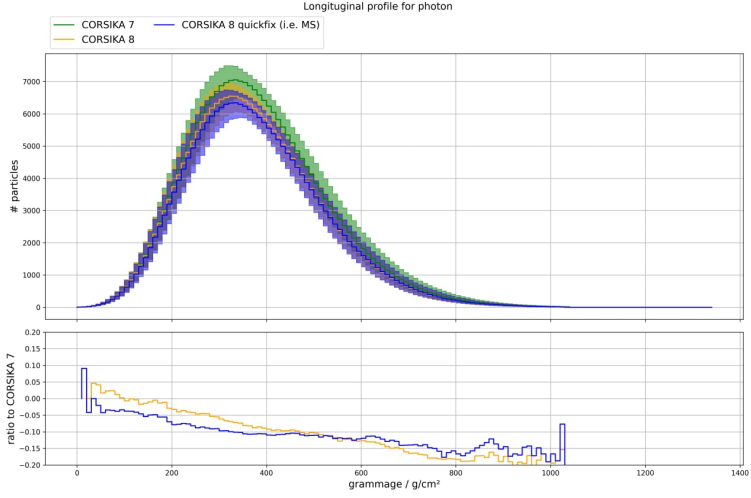
- Simulation of 1000 1 TeV electron-induced showers, particle cut of 500 keV
- For energies this low, longitudinal profiles are highly sensitive to multiple scattering
  - → Plots have been produced both without m.s. (master) and with m.s. (”quick fix”)



- Simulation of 1000 1 TeV electron-induced showers, particle cut of 500 keV
- For energies this low, longitudinal profiles are highly sensitive to multiple scattering
  → Plots have been produced both without m.s. (master) and with m.s. (”quick fix”)



- Simulation of 1000 1 TeV electron-induced showers, particle cut of 500 keV
- For energies this low, longitudinal profiles are highly sensitive to multiple scattering
  - → Plots have been produced both without m.s. (master) and with m.s. (”quick fix”)



Next steps

- If one goes to even lower energies (e.g. 100 keV particle cut), PROPOSAL prompts warnings due to numerical problems
  - → Can be avoided by using only-stochastic photon simulation
  - → First simulations show no significant differences in results or runtime
  - → See PR Draft 451 for details
- Looking forward to see...
  - ... how radio simulations will look like
  - ... simulations in combination with the new `Step` object