# COSMOS X as a general purpose air shower simulation tool

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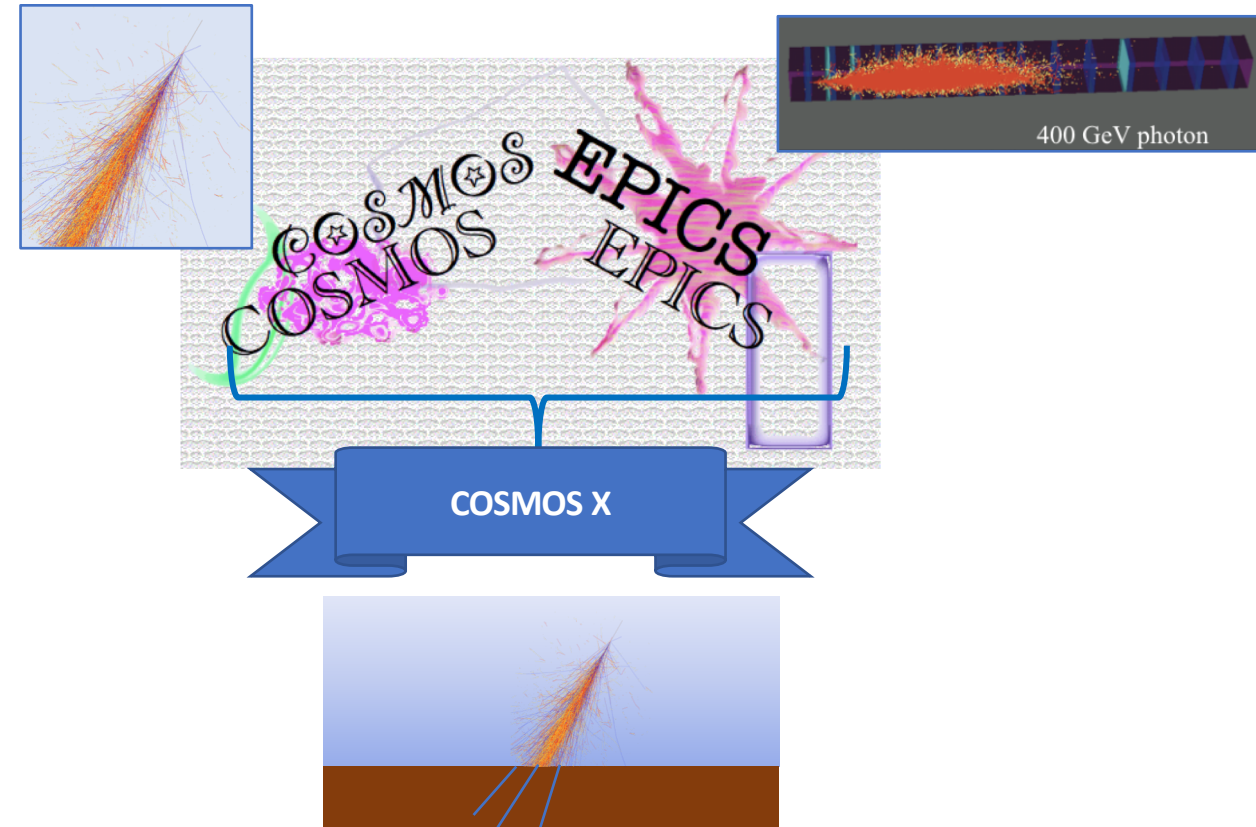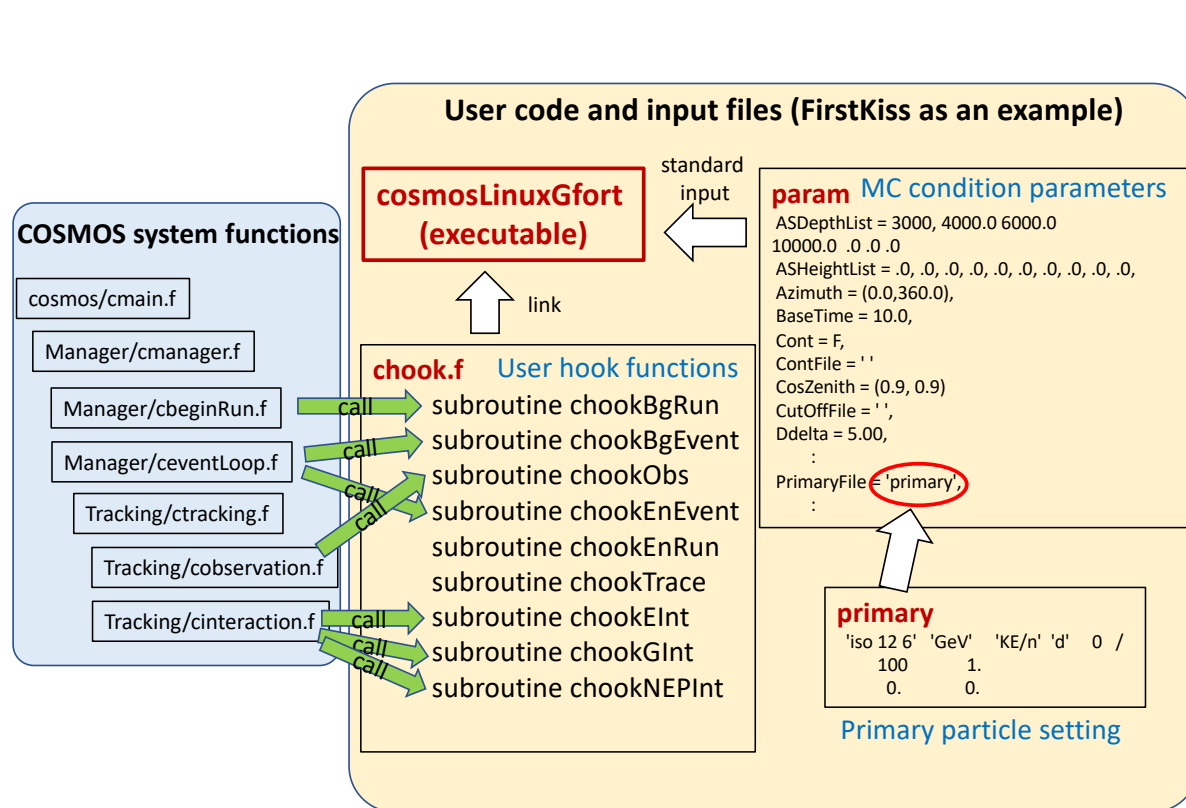
- Air shower MC simulation tool becomes more and more important in CR physics
  - *PID, muon puzzle, LHC, thunder cloud, solar gamma rays, etc…*
- COSMOS is an air shower MC simulation tool with flexible user control functions
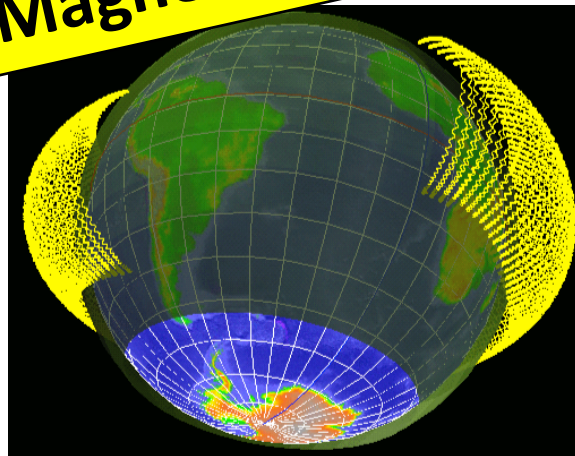- Combining with a detector simulation tool EPICS, *extended COSMOS, COSMOS X*, is born

COSMOS X Applications

A 100TeV proton shower above and below the ground

Trajectory of a charged particle trapped in the geomagnetic field
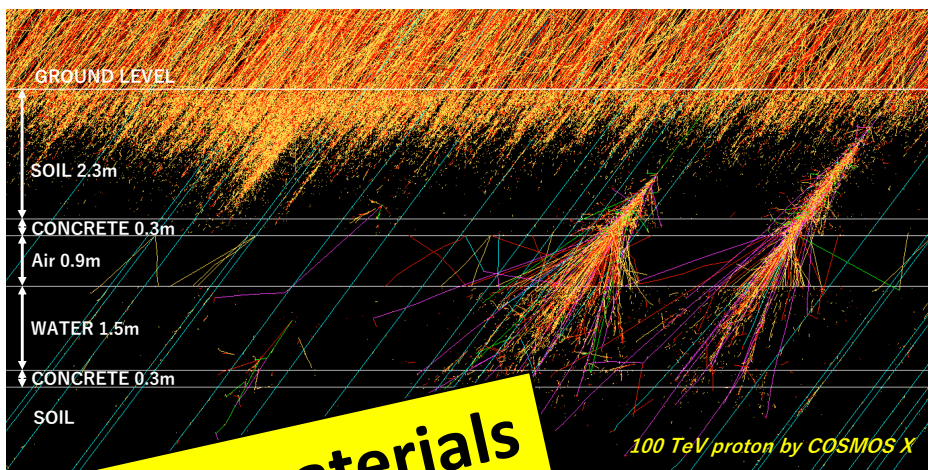
Magnetic field

Non-air materials

Tracking of a 10TeV proton in the solar atmosphere

Non-earth atmosphere

http://cosmos.icrr.u-tokyo.ac.jp/COSMOSweb/

- Variety of applications are possible using COSMOS X
  - Non-air materials : any gas, liquid solid
  - Arbitrary magnetic and electric fields
  - Non-earth conditions : spherical shell structures with a common center and arbitrary radii
- Try, enjoy and feedback us!!

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One page executive summary

- What is this contribution about?

  A new air shower MC simulation tool COSMOS X is developed.

- Why is it relevant / interesting?

  Importance of air shower simulation in Cosmic-ray physics is increasing

- What have we done?

  Combining an air shower MC tool COSMOS and a detector MC tool EPICS, **_extended COSMOS, COSMOS X_**, is developed

  Some examples of application are demonstrated

- What is the result?

  COSMOS X is public as a β version.   Enjoy and feedback!!

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