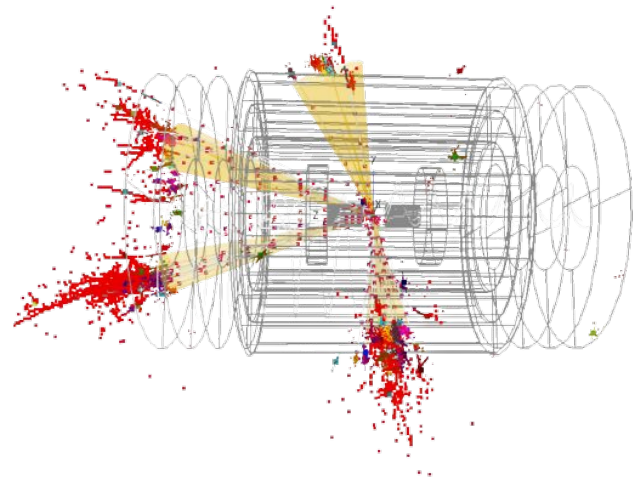# PHOENIX at Muon Collider

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Motivations

Event display is sometimes very useful

- Understand topologies of events
- Check geometry and sub-detectors placement
- Useful for outreach activities
- Have some nice picture to show at conferences :)

So far, we mainly rely in standard tools, such as `teveDisplay` and `ced2go`
- While very easy to use…
  - Very slow
  - Not fancy at all

One possible solution: PHOENIX

In 2017, HSF visualization white paper raised the question to have a common event display tool, experiment agnostic

- This is how PHOENIX was born
- PHOENIX allows you to:
  - Load your detector geometry
  - Load event data
  - Display them nicely and physics wise

- It is supported by the HSF visualization group
- It is the default event display for several experiments, e.g. ATLAS and LHCb
- Future colliders (FCC/CLIC) are starting to use it

One quick view at PHOENIX

Some nice properties of PHOENIX:

- It runs entirely on browser (very light and easy to share)
- Uses industry standard, such as three.js and angular, nodeJS, NPM (+
- other libraries)
- Extensible by design
- Easy to switch ON/OFF both sub-detectors and physics objects
- For a full overview, see [here](#)

https://hepsoftwarefoundation.org/phoenix/#/

What do you really need to reproduce this

Quite some stuff, but I'm planning in documenting all the steps:

- Geometry
    - Start from `.xml`, convert them to `.root` (using `TGeo`)
    - Convert `.root` file to `.gltf` (basically your 3D model)
    - Load it into PHOENIX

- Event data
    - Convert your `.slcio` to `.edm4hep.root`
    - Convert your `.edm4hep.root` to `.edm4hep.json`
    - Load it into PHOENIX

Possible only using the new release

Problems/open questions

So far, everything seems to work fine, but:

- We can't display tracks
  - Possibly related to new ACTS not saving TrackStates
  - Any idea on this?
- BIB, still to see if and how this works

- Documentation to be done
- So far, everything is local
  - If you interested in having an event display with PHOENIX, contact me

Thank you for your attention!