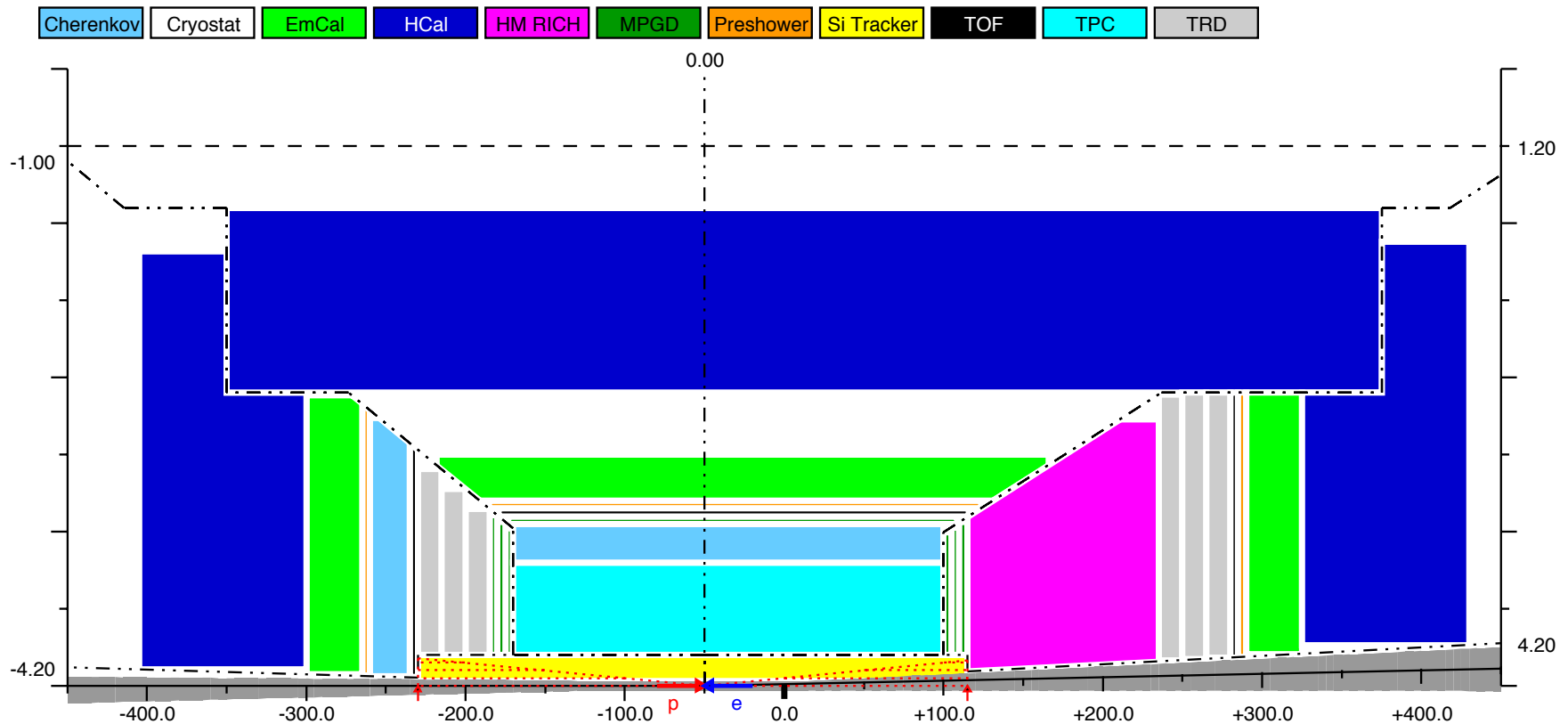# Integration software suite: overview

- **A tool to model & generate EIC Central Detector "templates" in a way:**

  ‣ the new geometries (models) can be generated "quickly" …

  ‣ … and represented instantly in a WYSIWYG fashion

  ‣ the sub-detector "container objects" are guaranteed to not overlap either with each other or with the IR vacuum chamber elements

  ‣ they can be imported in GEANT frameworks in a consistent way and used perhaps as wrappers to the "real" sub-detectors

  ‣ they can be exported in a CAD format to be used in the engineering design of the detector support structures and / or laying out services

- **Current version can do more than that:**

  ‣ vacuum chamber prototyping and export in TGeo and GDML formats

  ‣ B_T*dl integral evaluation for the endcap silicon trackers

  ‣ beam pipe material scan at small scattering angles

  ‣ models are persistent: can be saved and imported back *as a single entity*

Integration software suite: limitations

- **Four pre-defined detector "stacks": vertex, barrel, and two endcaps** …
- … **in a projective configuration (defined by the η ranges)**

- **Detector tags (like "EmCal") and respective colors are hardcoded …**
  - ‣ … though custom ones can be generated dynamically, if really needed

- **Detector volumes in a given stack are placed as objects with flat front and rear sides, one after the other, strictly orthogonal to either the electron beam line axis or to a normal to this axis in a 2D view …**
  - ‣ ... although stack boundaries can be shaped up creatively, if needed

- **Exported objects are azimuthally symmetric polycones, although …**
  - ‣ … with an asymmetric cutaway representing the IR vacuum chamber
  - ‣ … polyhedra (segmentation in wedges) will be implemented as well

- **Stack boundary crack width (support, services) is still work in progress**

Integration software suite: a typical 2D view

- **Repository:** https://github.com/eic/EicToyModel
  - has a README file (surprise!) and a calorimetry example
  - detailed API description will follow later this week

Integration software suite: calorimetry example
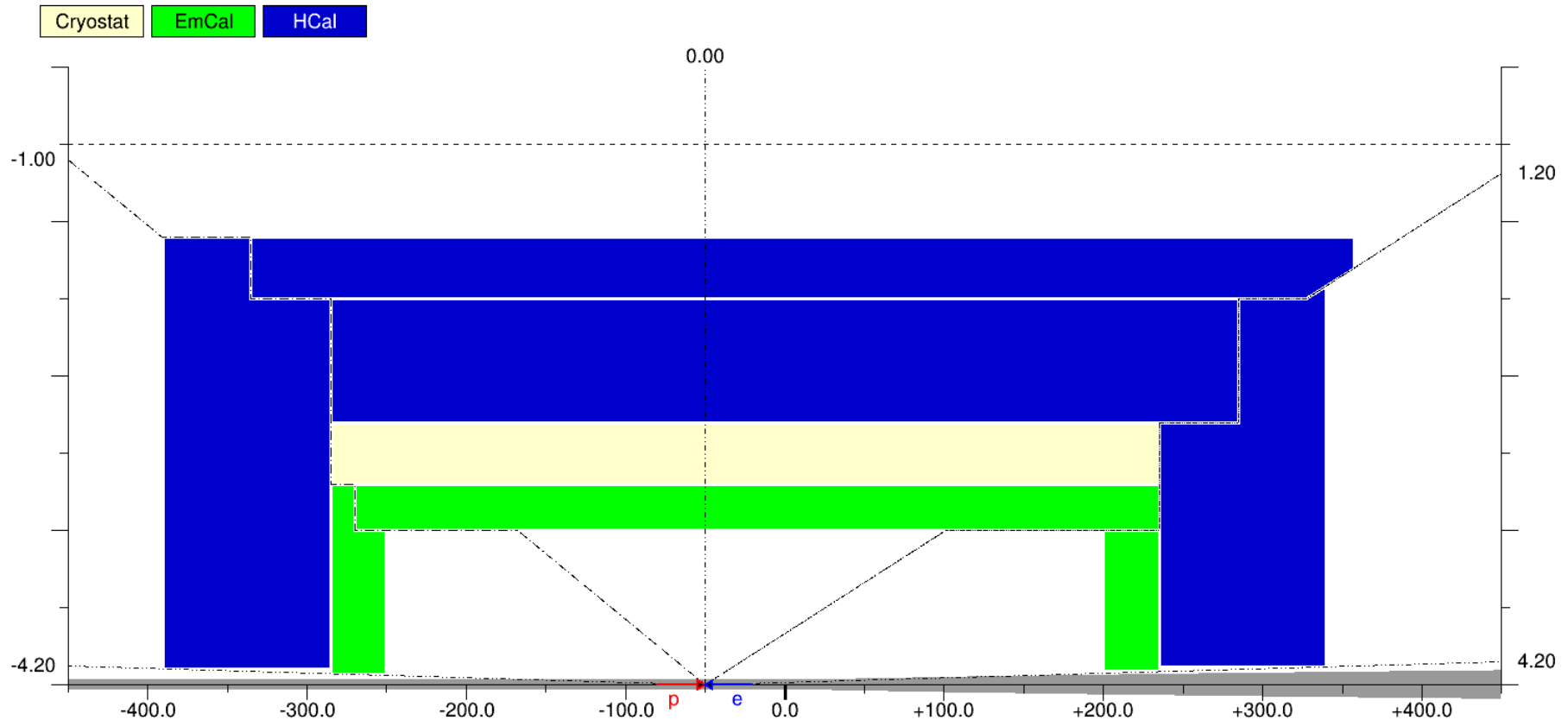
- **All the available stack layout & boundary options are shown here**
  ‣ https://github.com/eic/EicToyModel/blob/master/scripts/calorimetry.C
  ‣ Is it enough for calorimetry?
  ‣ Anyway, what else is critically missing in the description?