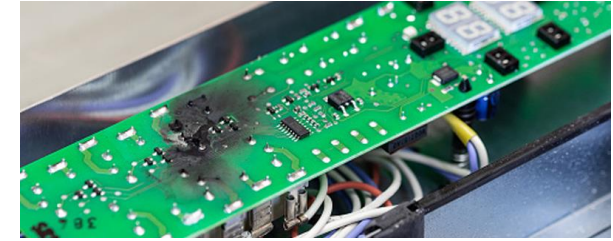


# R2E 2024 H8 Test Plans

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23/07/2024 - H8 Beam Line 2024 Users Meeting

# 2024 Objectives



## Motivation

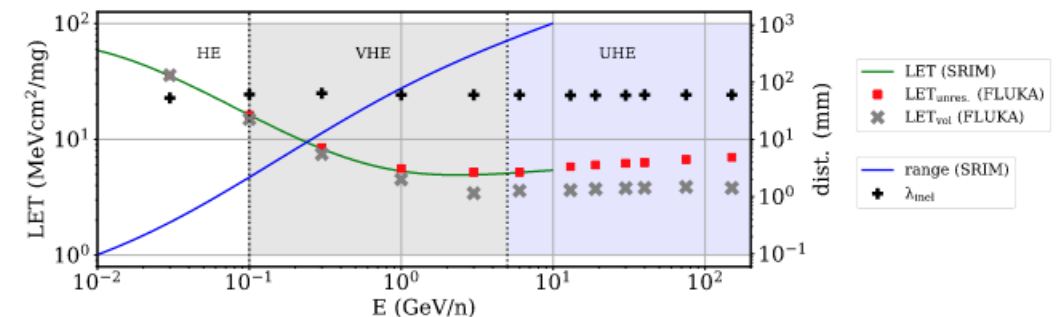
- ❑ Ultra-high energy (UHE) ions are a concern in both accelerator and space environment, in particular, after their fragmentation in smaller ion and hadrons,
- ❑ Inelastic length is shorter than stopping length, so UHE ions are actually not stopped/shielded but fragmented,
- ❑ Continue 2022 and 2023 work in H8-138.

## Fragment/hadron secondaries characterisation

- ❑ Additional measurements, closer to the beam, transversally to the fragmenter,
- ❑ Perform measurements further downstream to achieve smaller angles with respect to beamline.

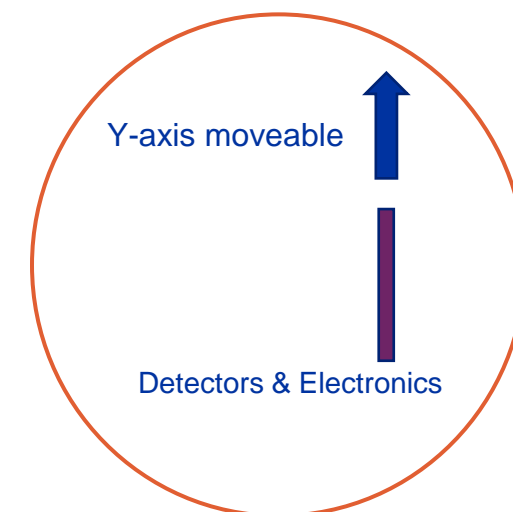
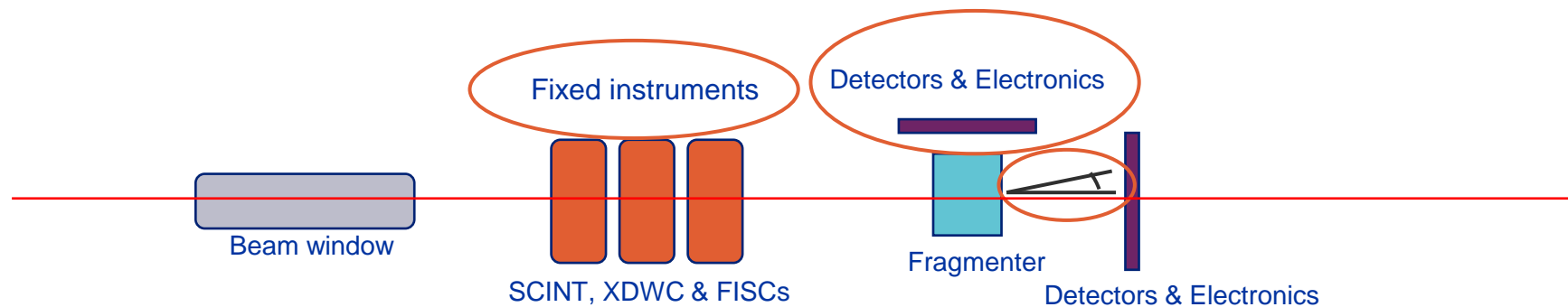
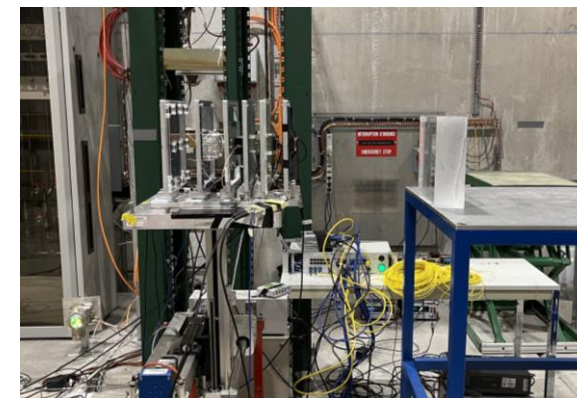
## Ultra-high energy ion SEEs

- ❑ Reach larger fluences from primary beam,
- ❑ Detect SEE from secondary fragment products (rarer),
- ❑ Use of fragments directly from beamline



R. G. Alía *et al.*, “Ultraenergetic Heavy-Ion Beams in the CERN Accelerator Complex for Radiation Effects Testing,” *IEEE T Nucl Sci*, vol. 66, no. 1, pp. 458–465, 2019, doi: 10.1109/tns.2018.2883501.

# Setups

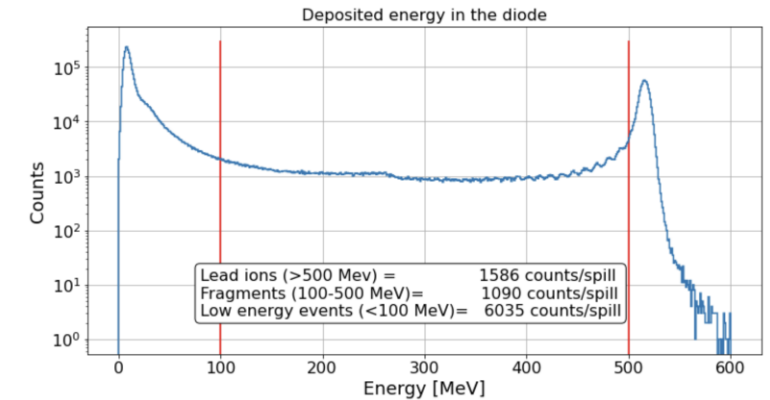


Actual setup and measurements still under study

# 2024 Requirements

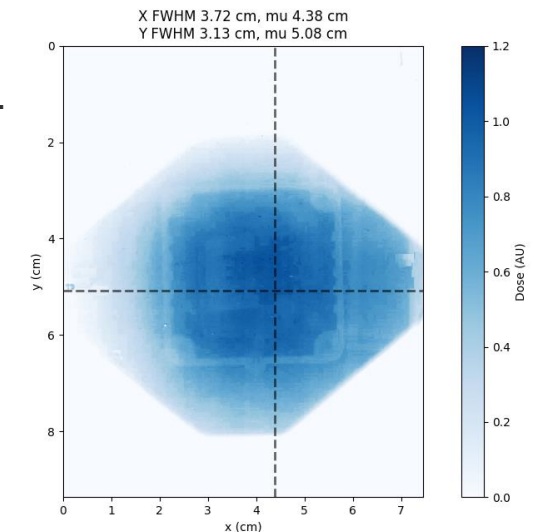
## Beam requirements

- ❑ Higher beam intensity:
  - 2022 intensity 4e3 ions/spill in 2022,
  - To focus on rarer inelastic events and SEEs in electronics, higher fluence needed,
  - Reach 1e5 ions/spill (within RP limits, of course).
- ❑ Smaller beam size for SEE testing:
  - 2022 beam profile gaussian 4x3 cm<sup>2</sup> (FWMH),
  - Electronic parts are small (order 1 cm<sup>2</sup>), thus smaller beam can be more efficient (effective flux).
- ❑ Ion fragments for beamline
  - What are the Z/A limits?



## Facility / beamline requirements

- ❑ Scintillator and XDWC constantly on beam
  - Constant, repeatable measurements throughout spills,
  - Less R2E detectors to be used (schedule constraints with East Area/CHIMERA operation).
- ❑ Additional supports/tables





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