TDIS mTPC update

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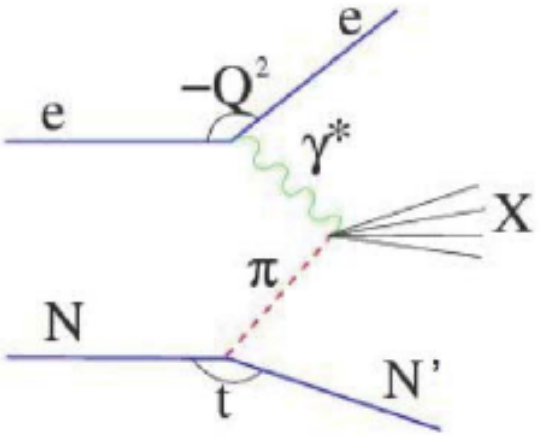
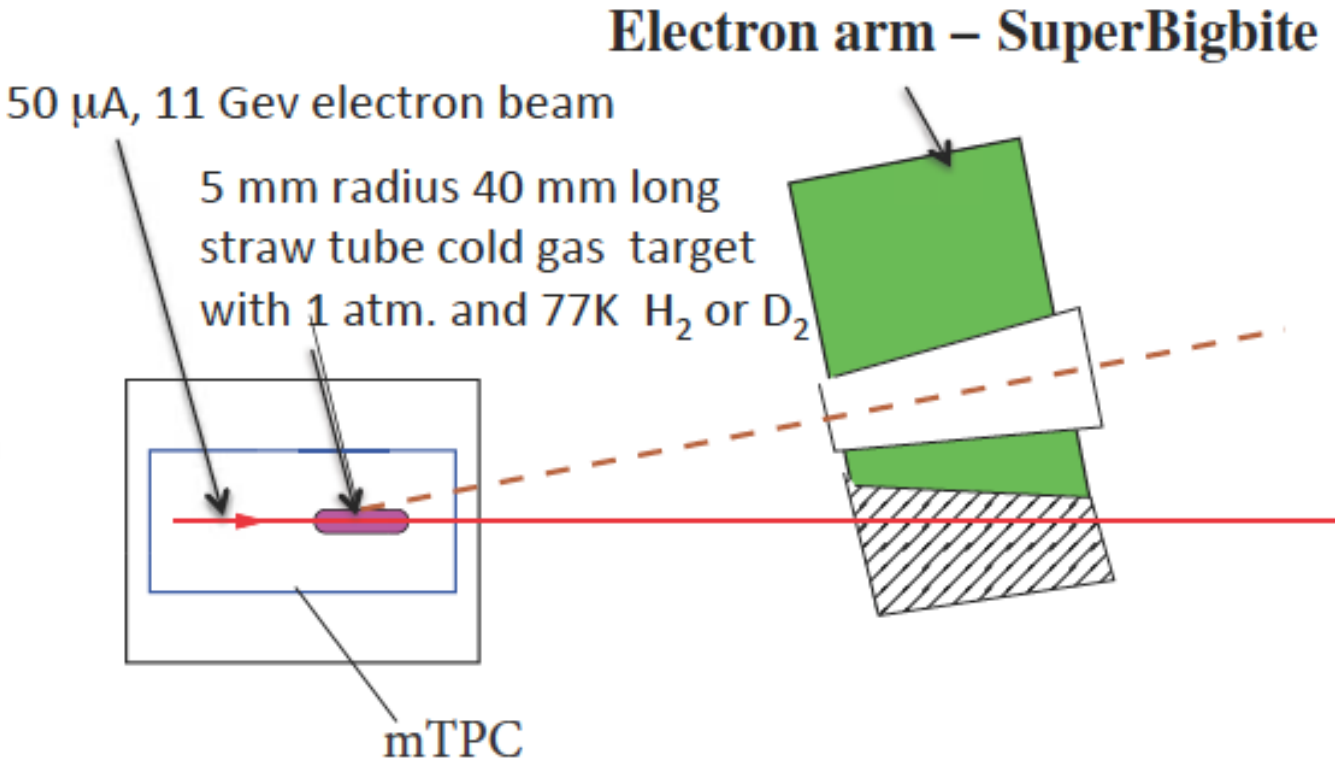
UVa

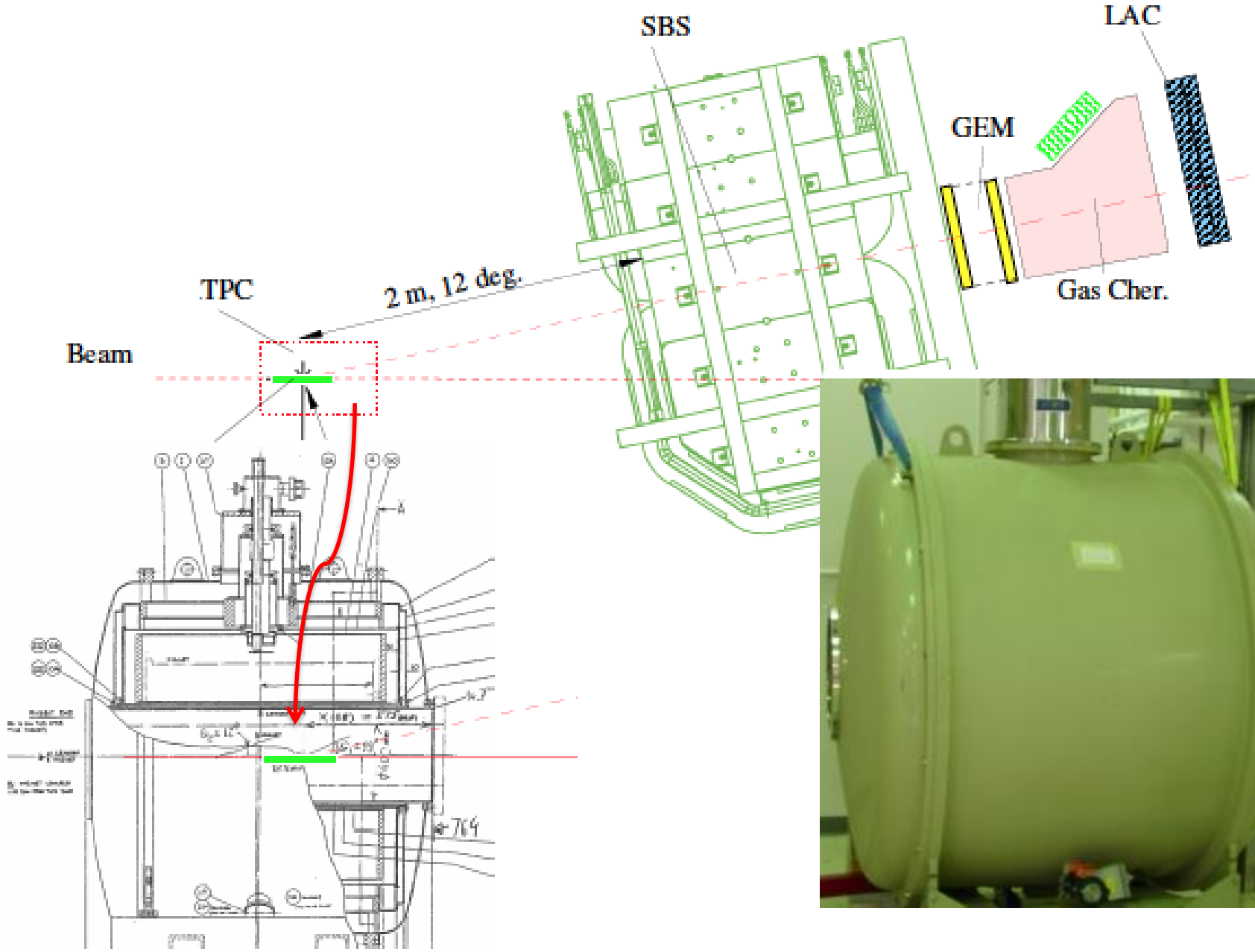
TDIS: Physics Motivations

- measurement of (DIS) cross section off meson cloud , while tagging low-momentum recoil spectator proton, to measure pion structure function.
- Tag proton and pion from lambda decay to to make the first ever measurement of Kaon structure function.
- Neutron DVCS with proton tagging.





TDIS Concept



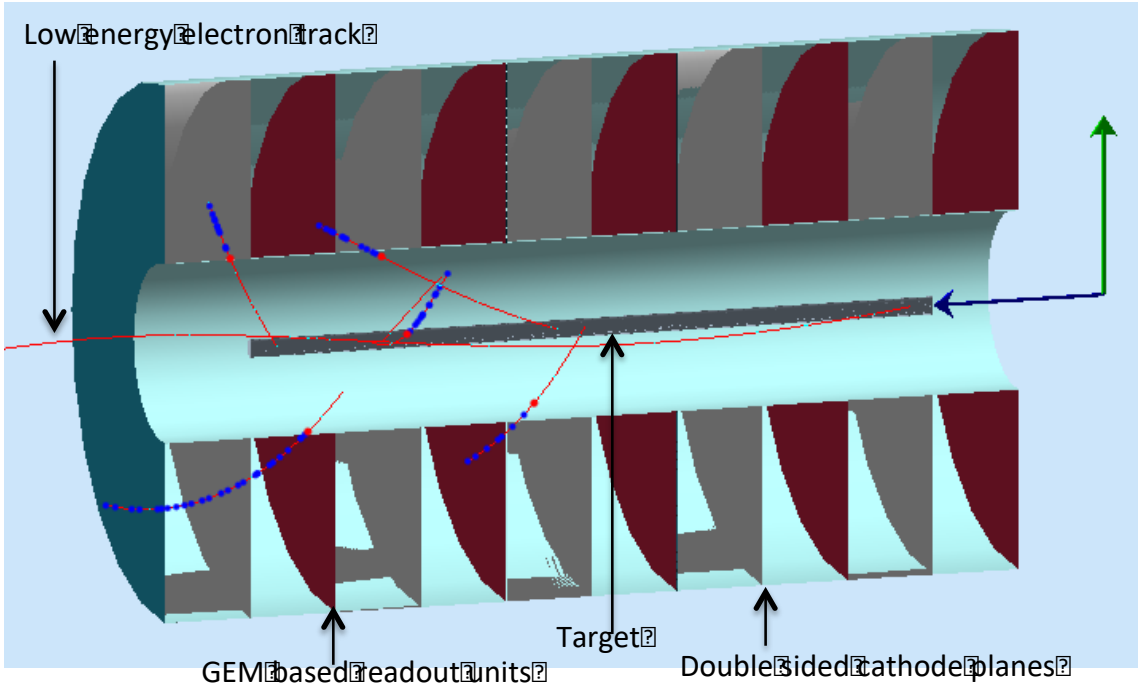
Status – MRI

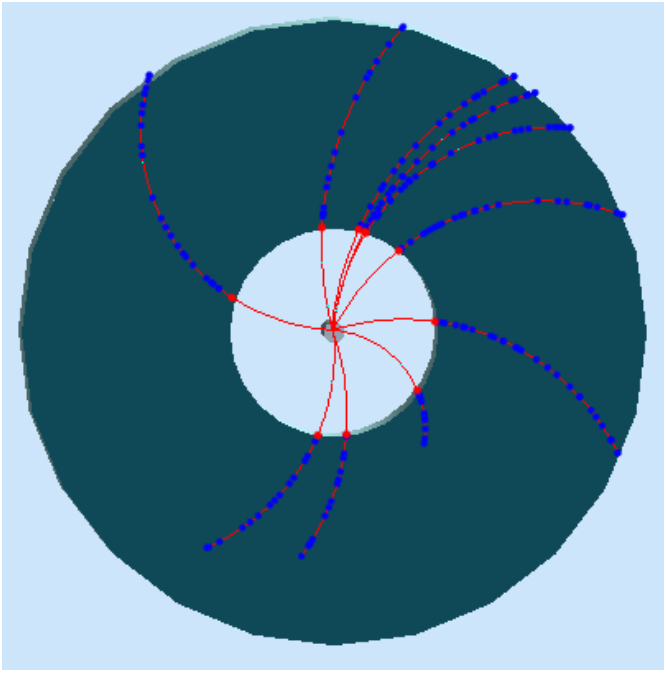
- The NSF Major Research Instrumentation (MRI) proposal developed and submitted in January: (Status: still pending at NSF as of this morning)
- Consortium institutions: UVa and Hampton in collaboration with Jlab and TDIS collaboration institutions.
  - UVa portion:
    - mTPC development, prototyping and construction: $ 687 k
    - UVA contribution: $ 206 k
    - UVa NSF request: $ 489.5 k
  - Hampton Portion
    - Readout electronics and mTPC end-caps: $ 472 k
    - Electronics development at Jlab, Hampton will procure components and participate in assembly
    - HU NSF request: 472 k
  - Total NSF request: $ 953 k
  - Proposed project period: 09/2019 – 09/2021 (or when funding comes from NSF)

Status – design and prototyping

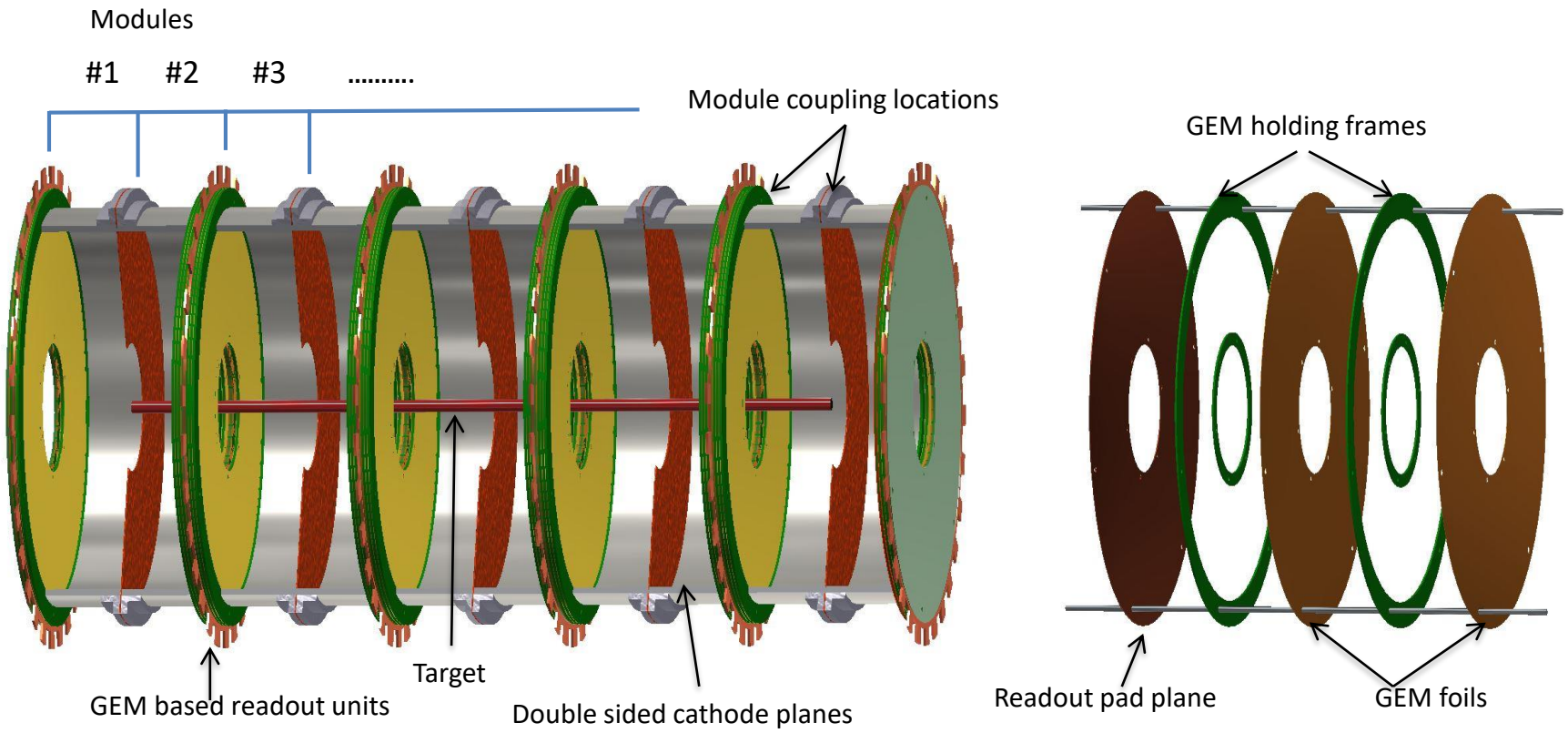
- Received a ~ $ 25 k UVa internal pilot grant (4-VA) for early design, prototyping and MRI proposal development.
- Design improved and optimized as part of the MRI proposal development
- Now we also have a design for the 0^{th} level prototype
- Expect to be able to complete this prototype before the expected start of the MRI project.

Curving tracks in magnetic field

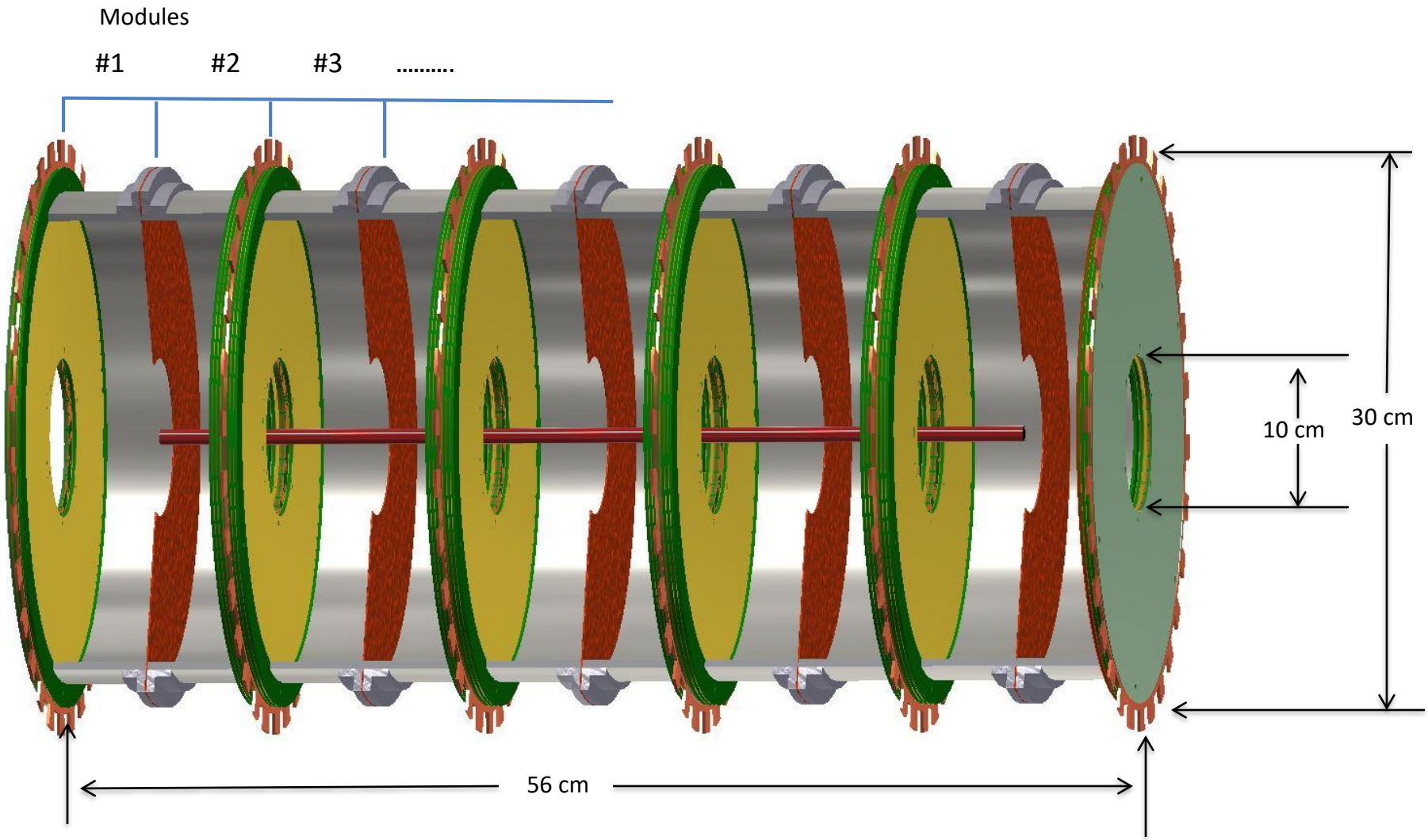




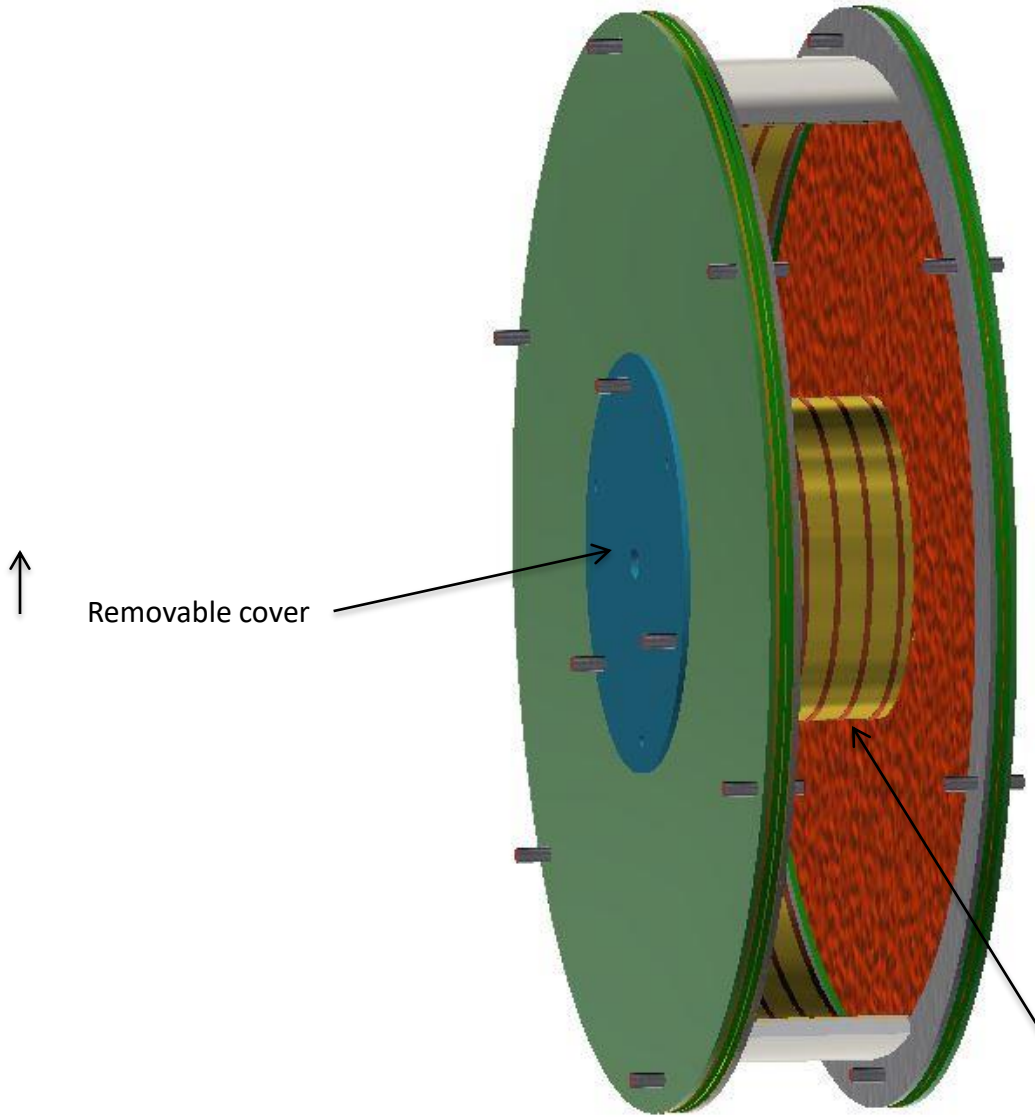
Design for the full mTPC

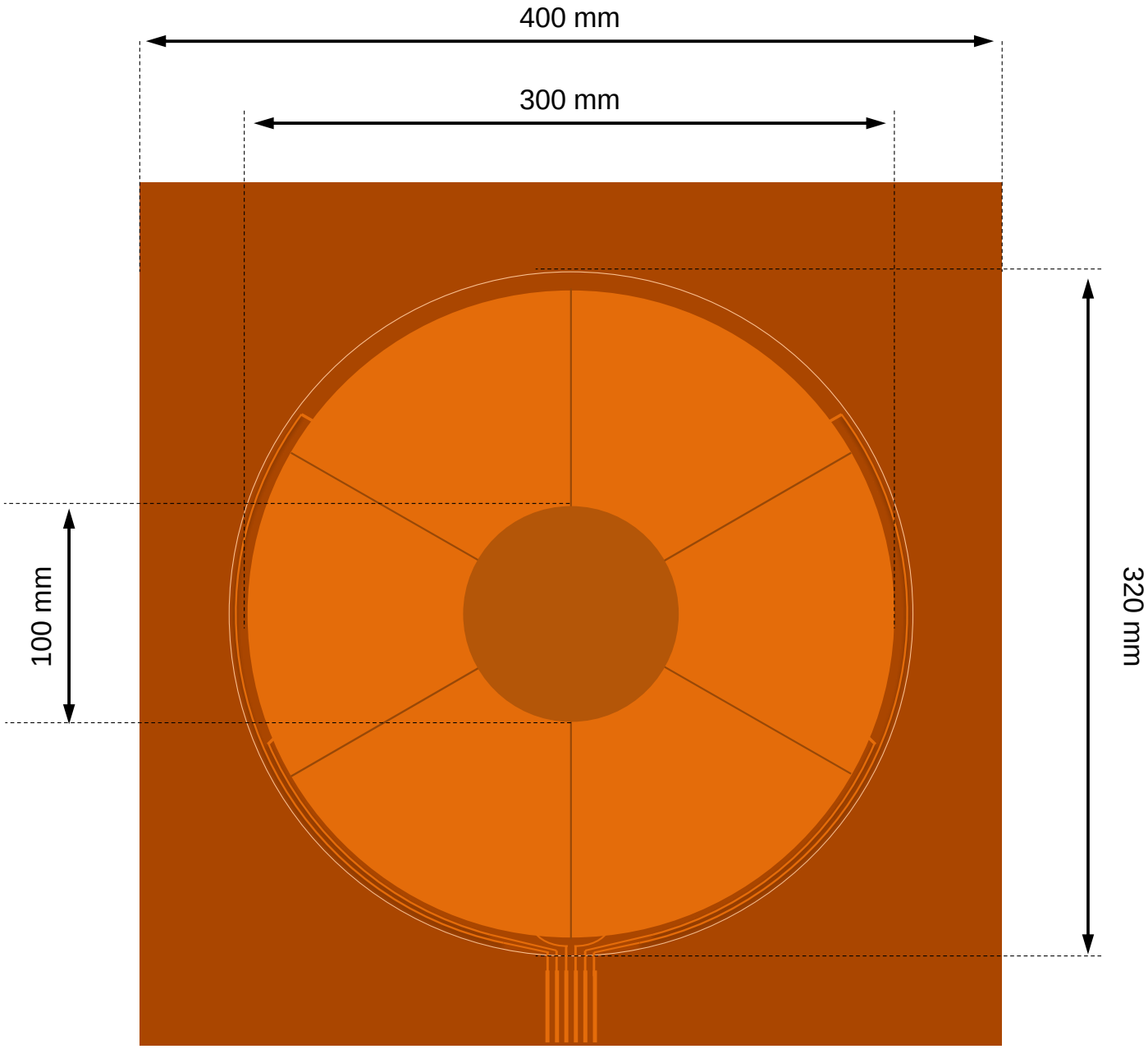


Conceptual design for the full mTPC



A single module

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