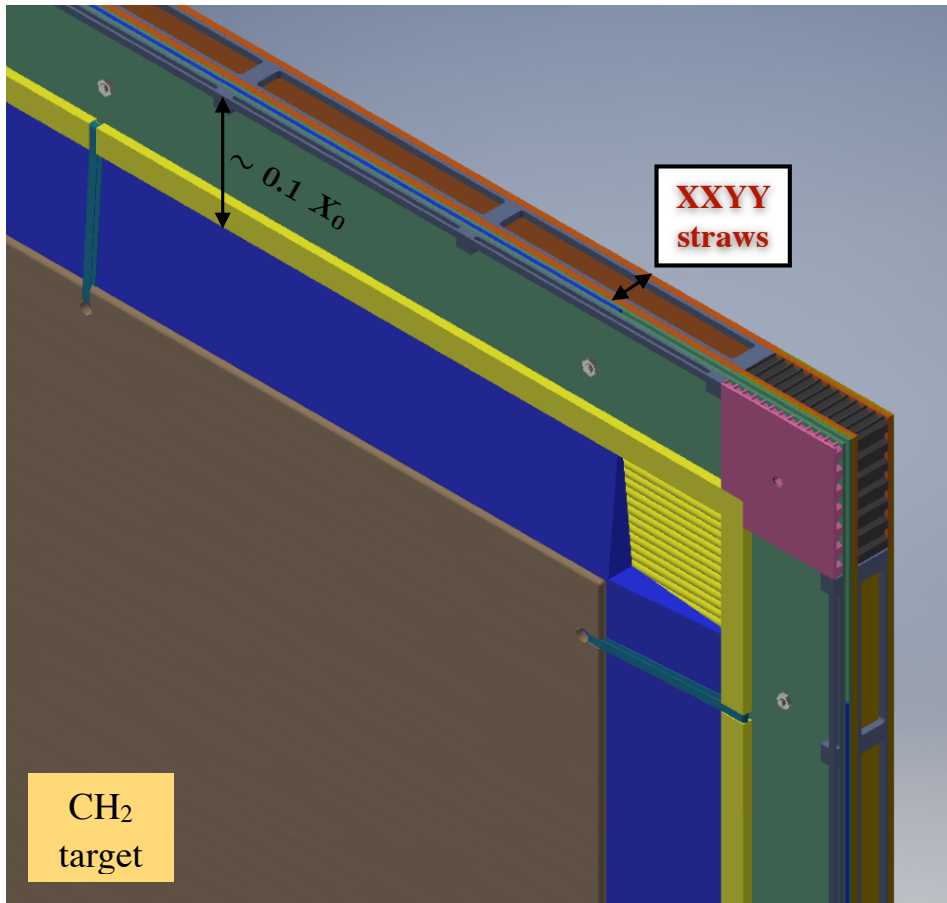


Update on Design of STT Modules

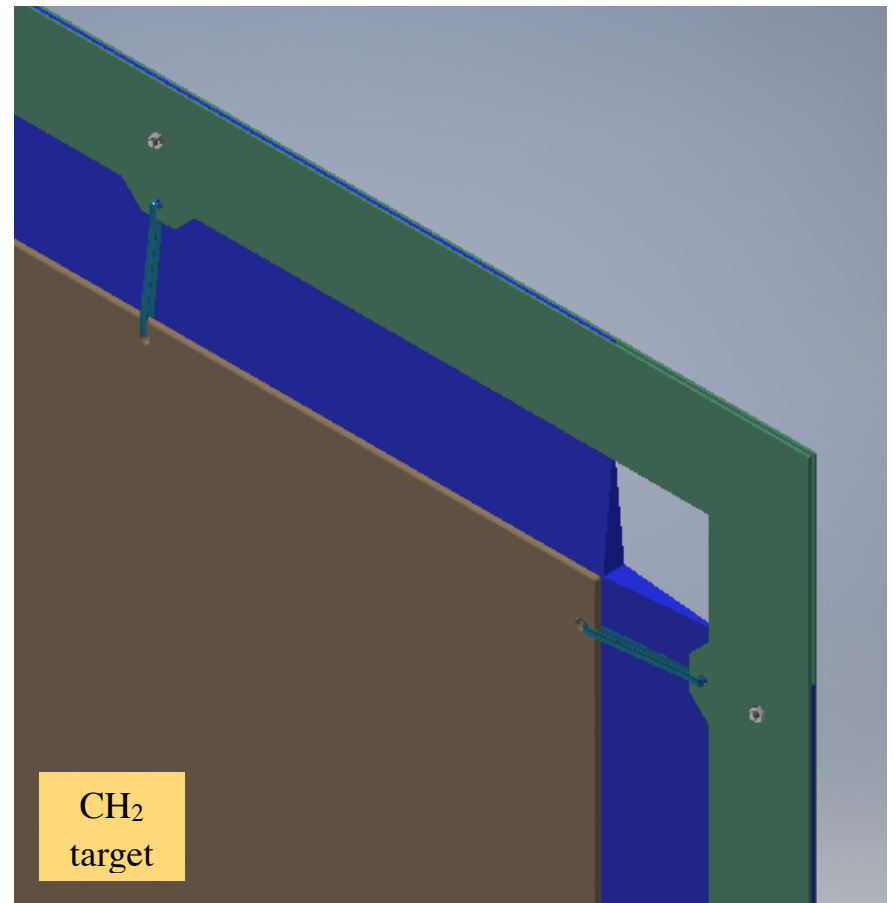
R. Petti

University of South Carolina, Columbia SC, USA

*DUNE ND meeting
November 13, 2020*



*Module assembly with CH₂ target and radiator:
maximal density $\sim 0.18 \text{ g/cm}^3$*



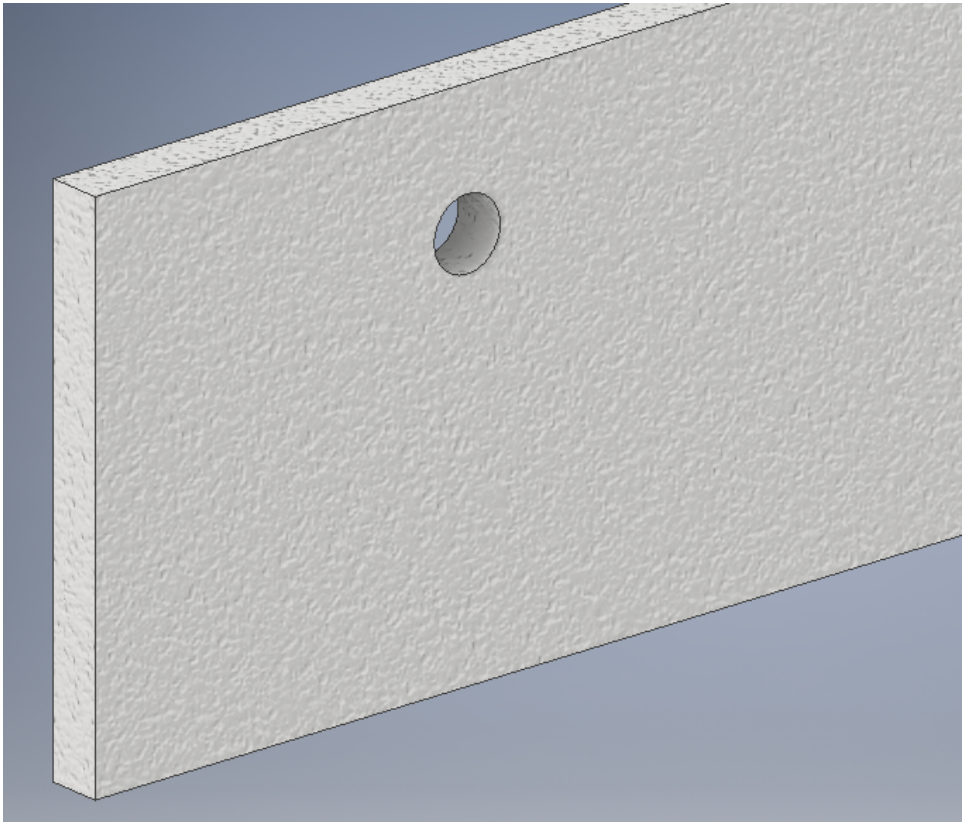
*New assembly of CH₂ target and radiator:
details of support frame*

- ◆ *Need to add a spacer to the upstream side of the CH₂ target module:*
 - *No structural role in the assembly of the STT modules;*
 - *Maintain the correct spacing between 2 consecutive modules in the complete STT assembly.*

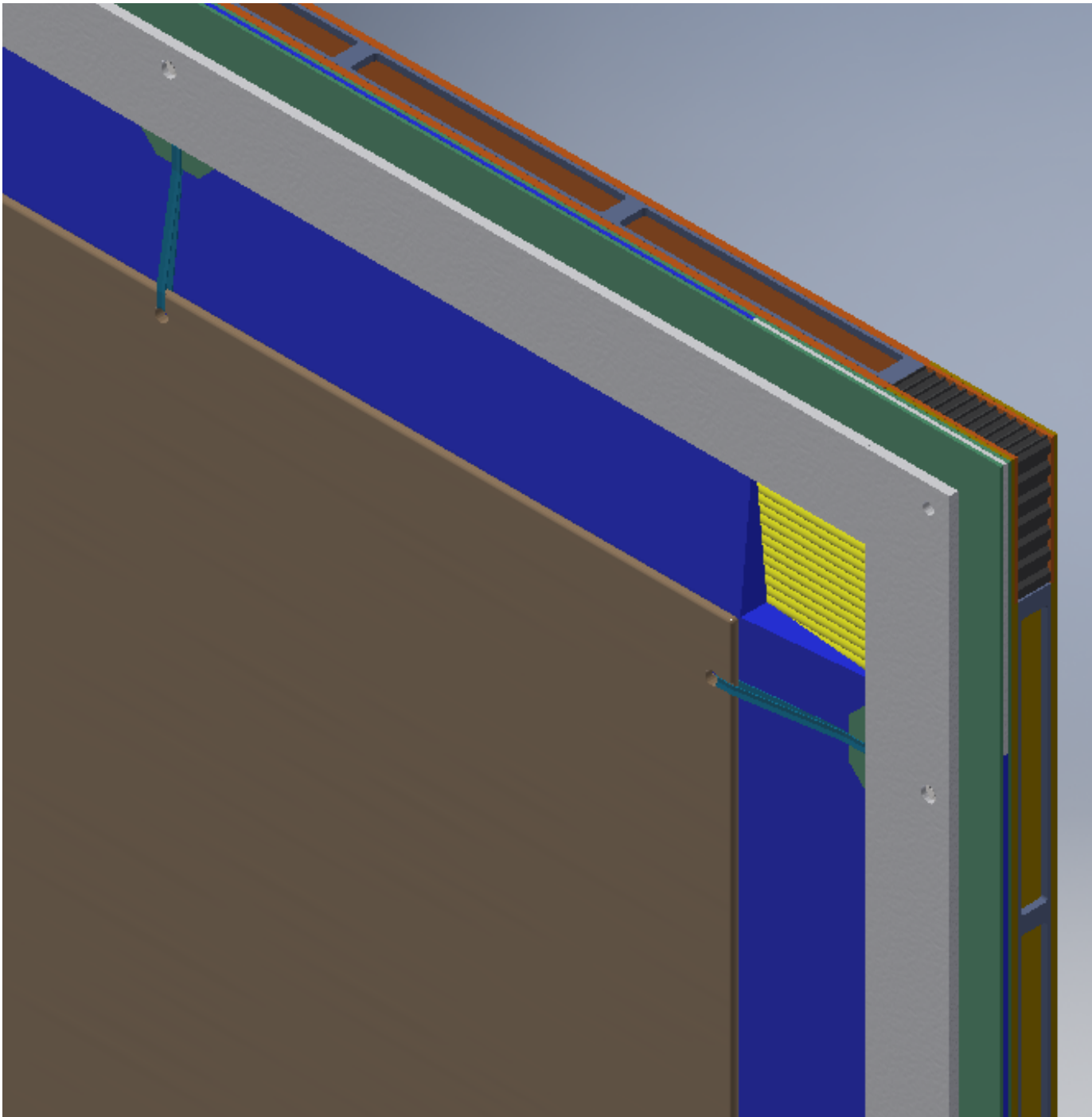
- ◆ *Fabrication tolerances can play a role in the assembly of 90 consecutive thin modules*
⇒ *Flatness (100 μm/m from vendors) and overall module thickness*

- ◆ *Use solid strips of Expanded Polypropylene (EPP) as spacers:*
 - *Glued to upstream side of target frame;*
 - *A density of about 0.2 g/cm³ provides enough rigidity to maintain spacing;*
 - *EPP can absorb variations in module thickness compensating tolerances;*
 - *Variation of module thickness: EPP spacer tuned for a specific configuration of target slab + radiator.*

- ◆ *Tolerances on CH₂ & graphite targets can be absorbed by radiator and frame thickness*
⇒ *Each individual target element must be weighted with precision scale*

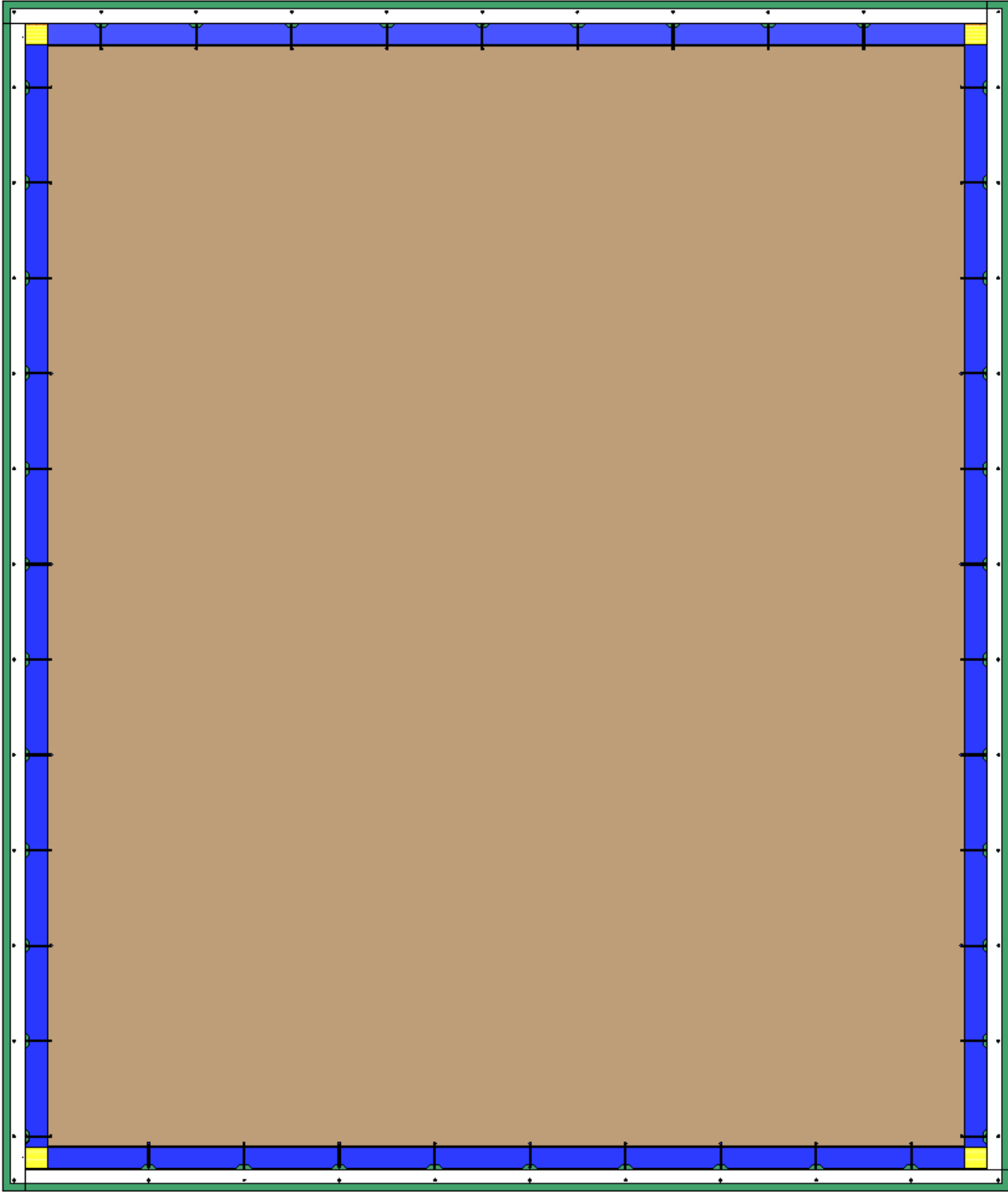


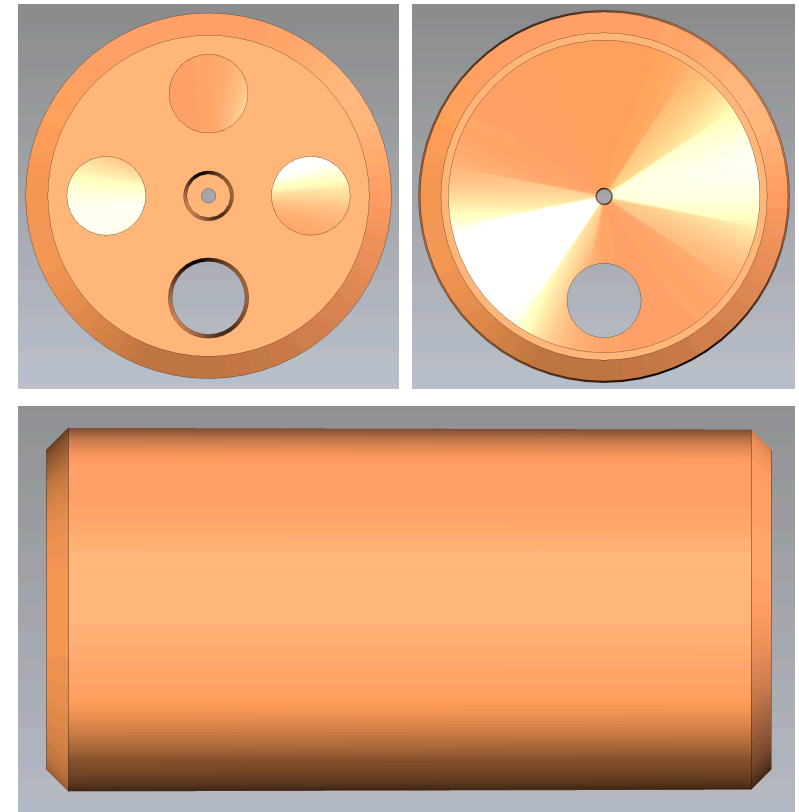
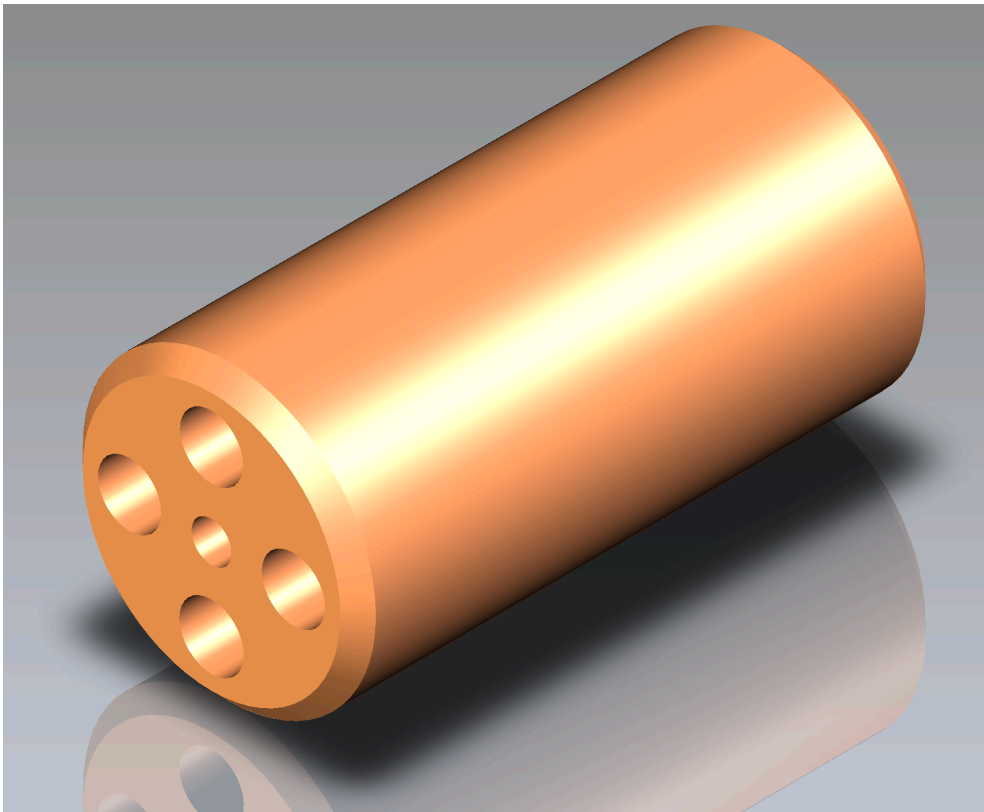
Expanded Polypropylene spacers



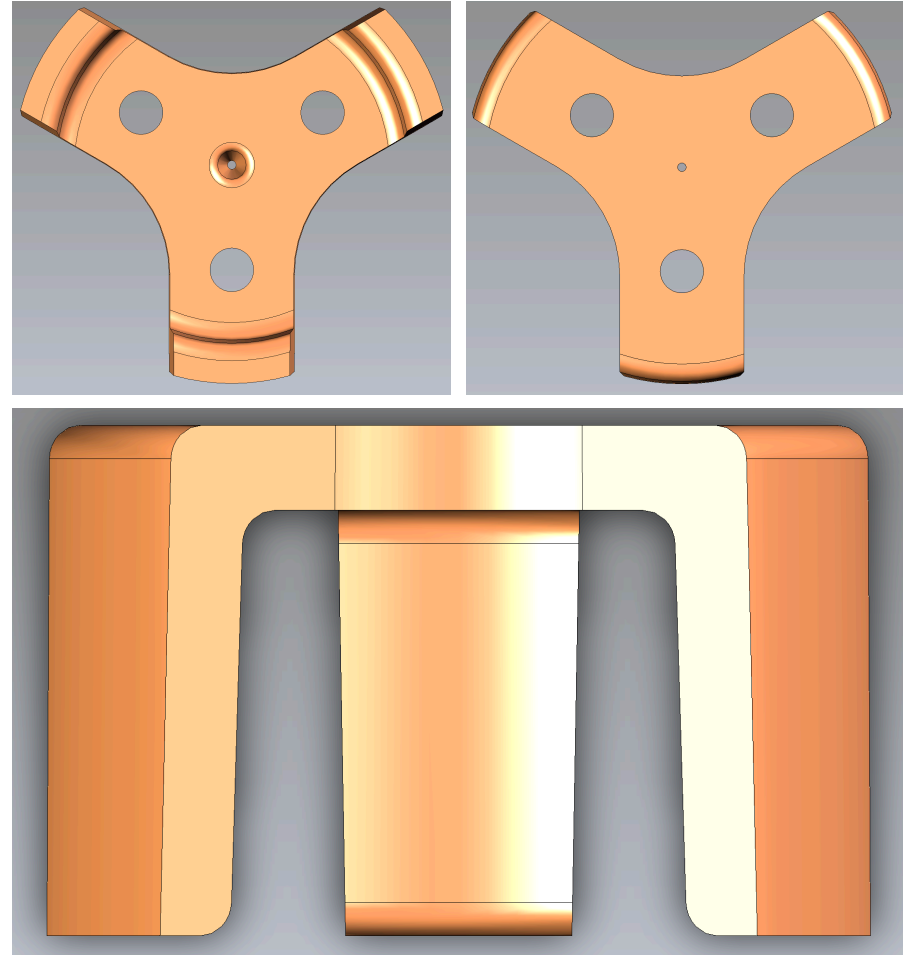
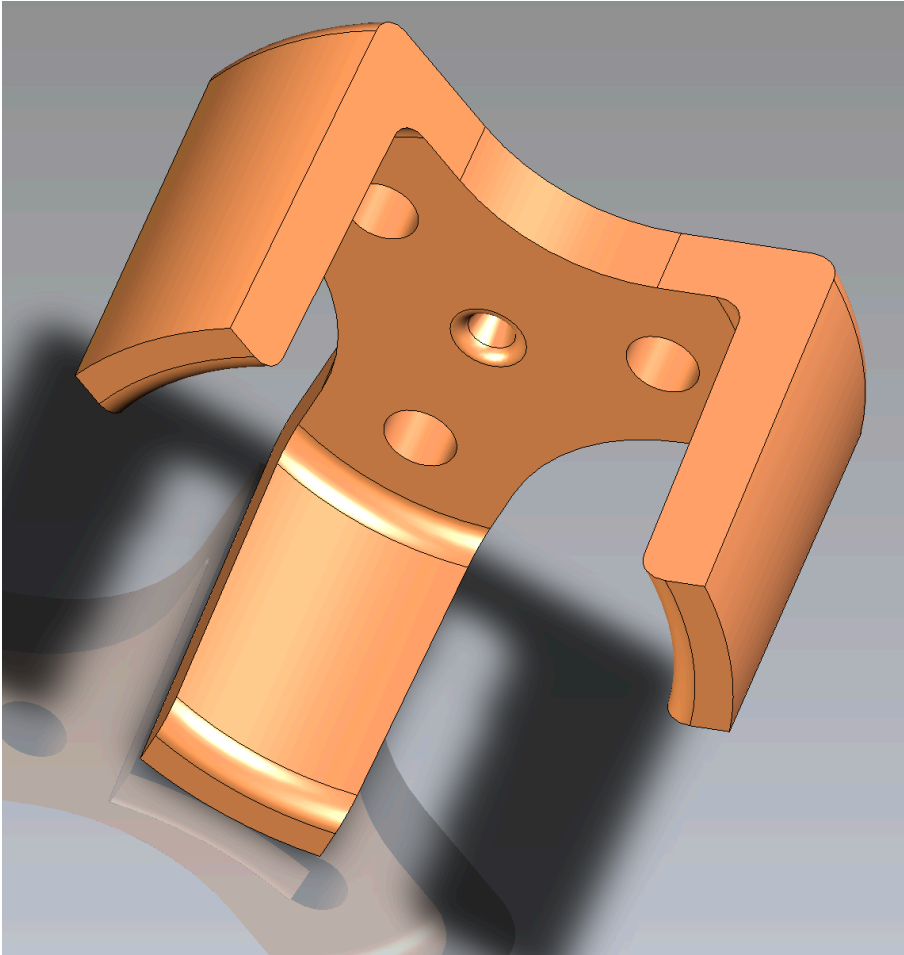
*New module assembly with
CH₂ target and radiator
+ tunable EPP spacer*

*Frame v1 (2019):
404 parts
Frame v3 (current):
36 parts*



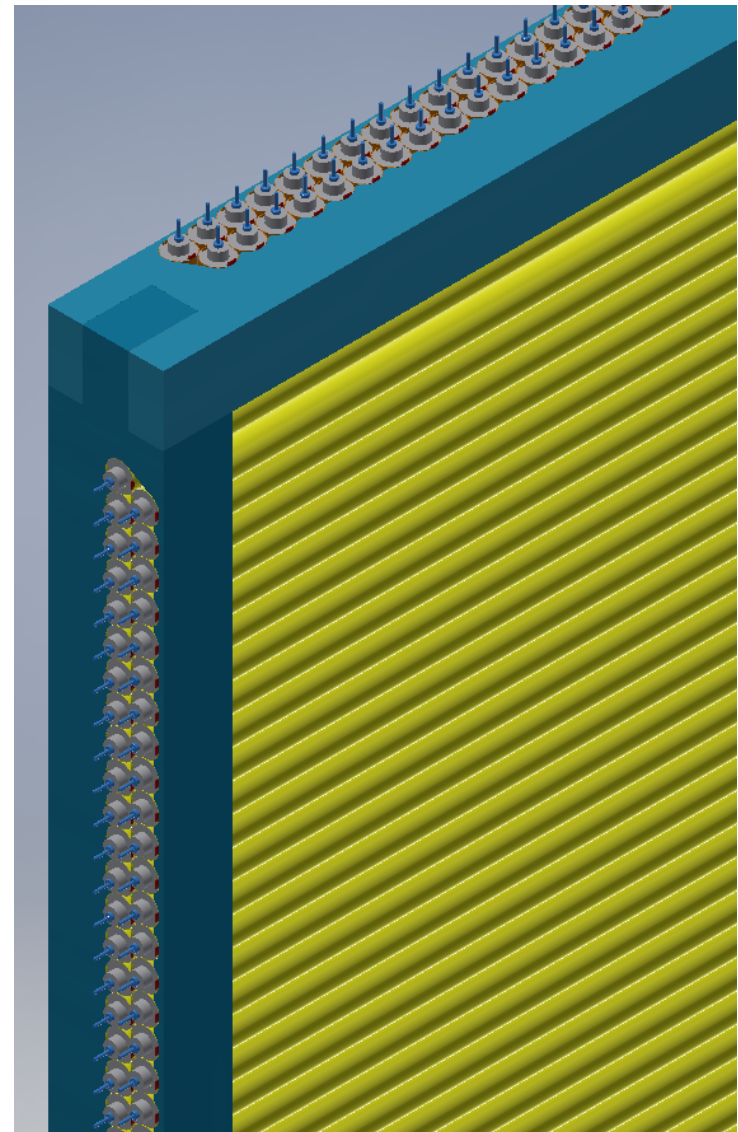
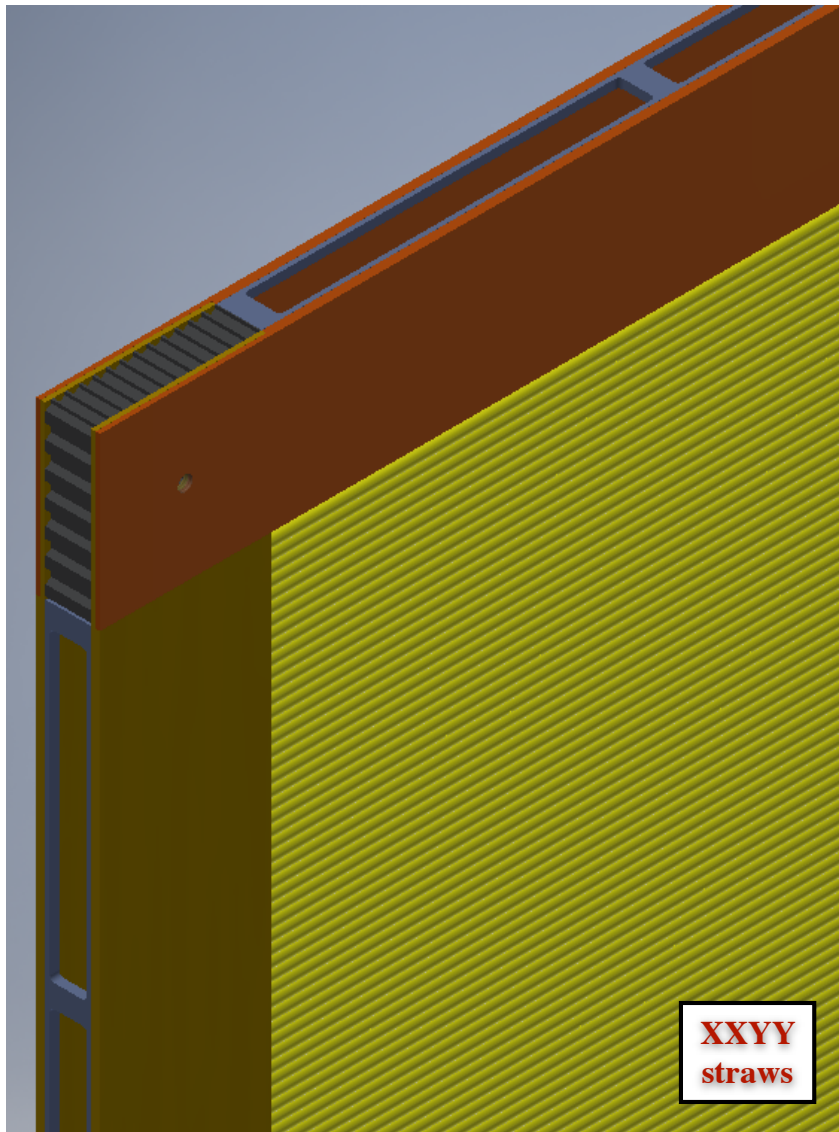


Design of the straw end-plugs: single plastic piece to be produced by injection molding



Design of the wire spacers: single plastic piece to be produced by injection molding

Backup slides



Target & radiator easily unmounted by removing 4 corner screws: density $\sim 0.005 \text{ g/cm}^3$