Cosmic Ray Tagger (CRT) Mounting Scheme

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Summary of CRT design/mounting conceptual design status

- Initial design for module complete
- Initial modifications to warm vessel to allow for CRT mounting complete
- Conceptual CRT mounting scheme allowing for multiple module overlaps to minimize dead areas complete
  - Mounting scheme can be used for single-layer or double-layer CRT modules
- Remaining steps:
  - Improve conceptual warm vessel model, including full model of CRT modules mounted to frame, including access to cryostat top electronics region with emergency escape
  - Initial costing

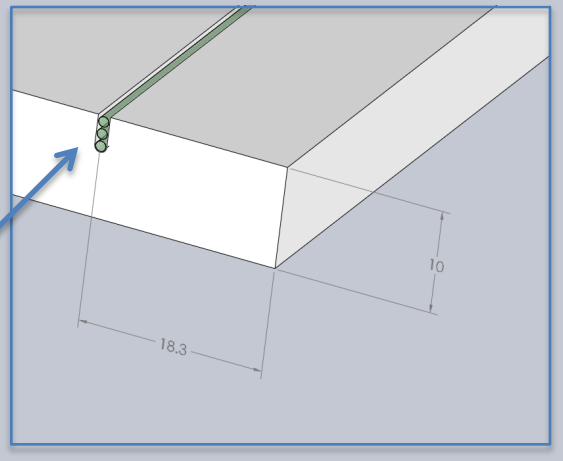
170mm X 2m X 10mm Scintillator Bars with Serpentine Trench

DUNE PD Prototype Example

Polystyrene/POPOP
Scintillator with
Co-extruded TiO Coating

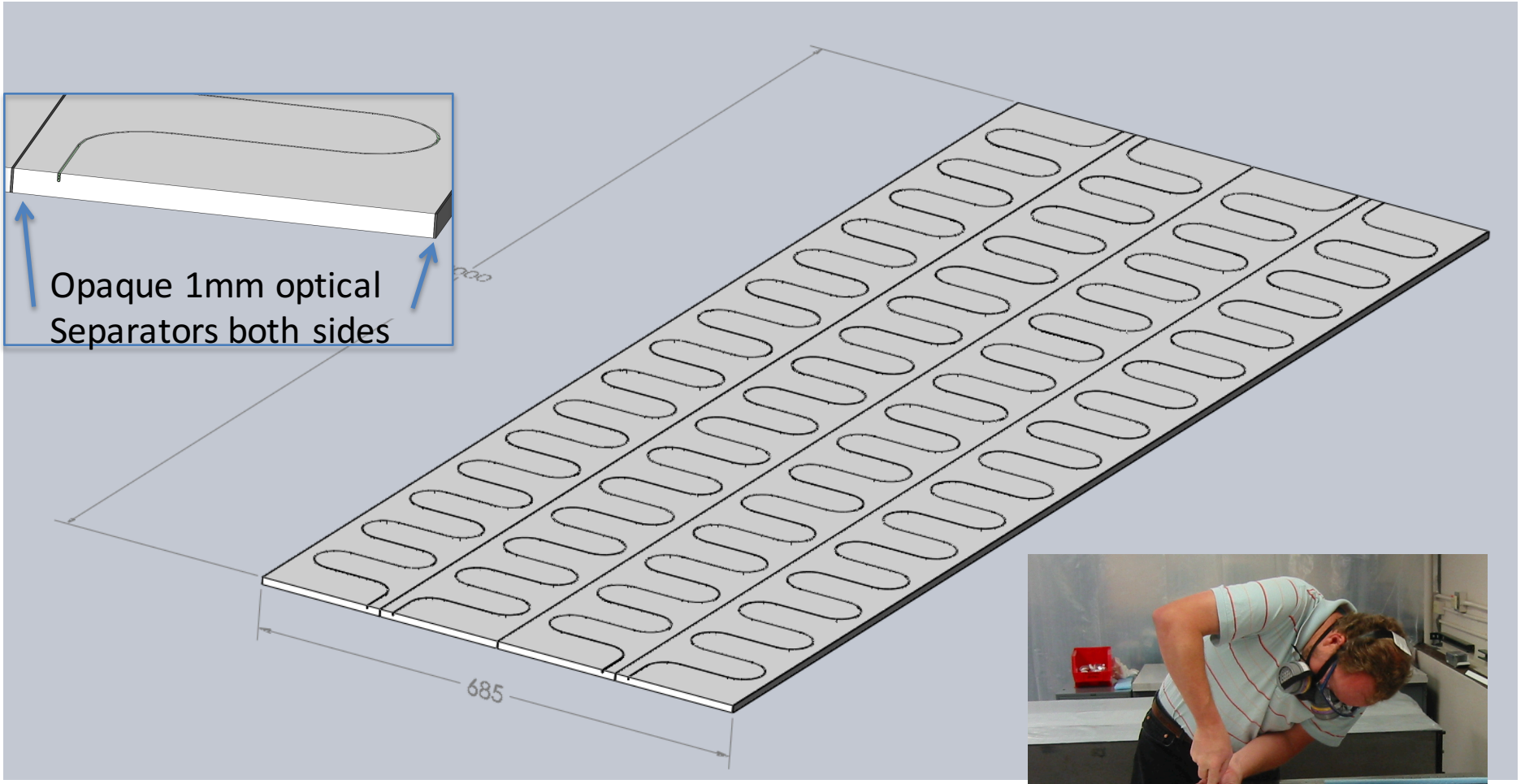
31.75mm bend
Radius for fiber

3X 1mm DIA
Y-11 Fibers Epoxied
Into milled slot



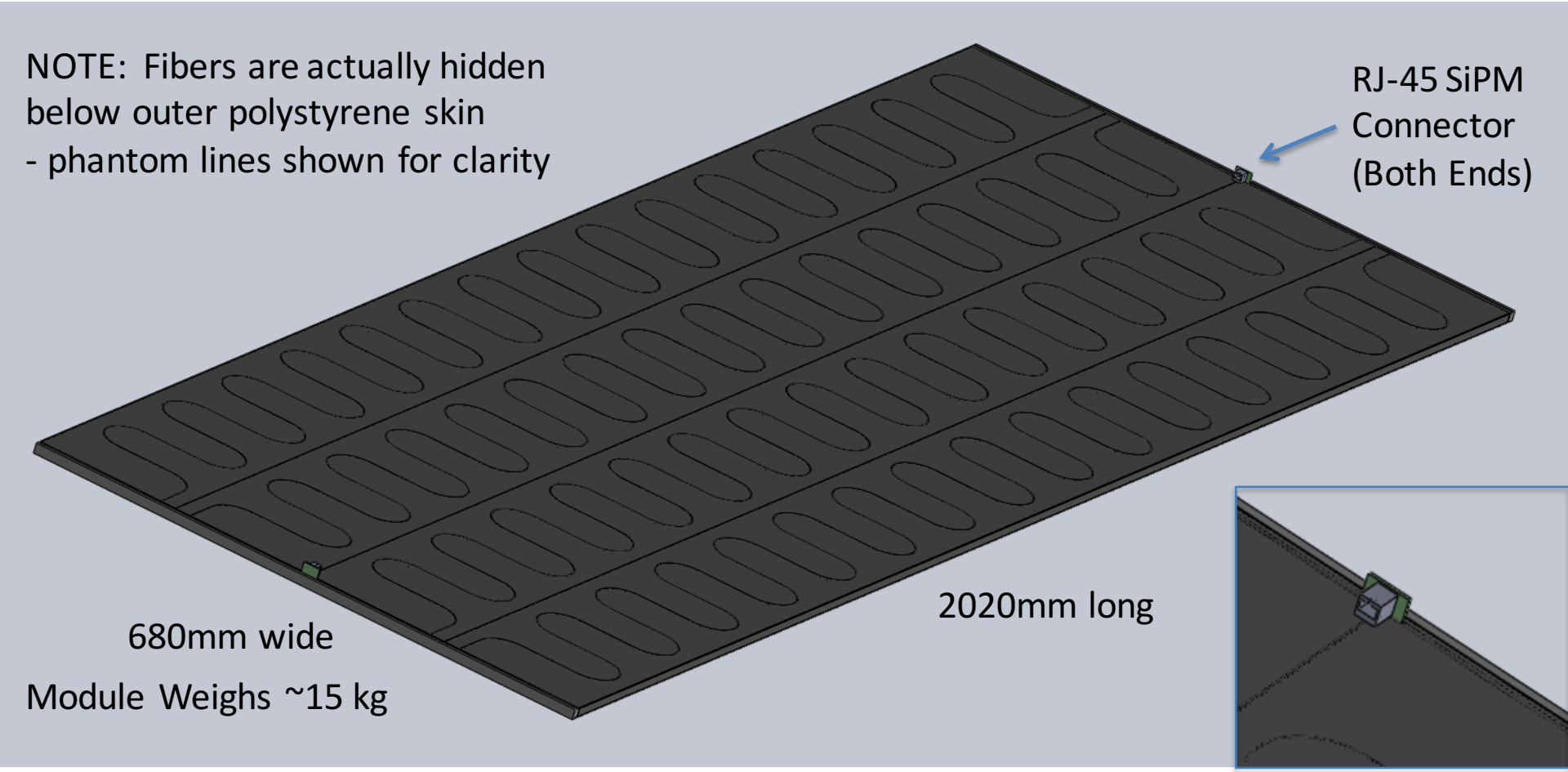
Bar End Detail

4 Scintillator Bars Joined

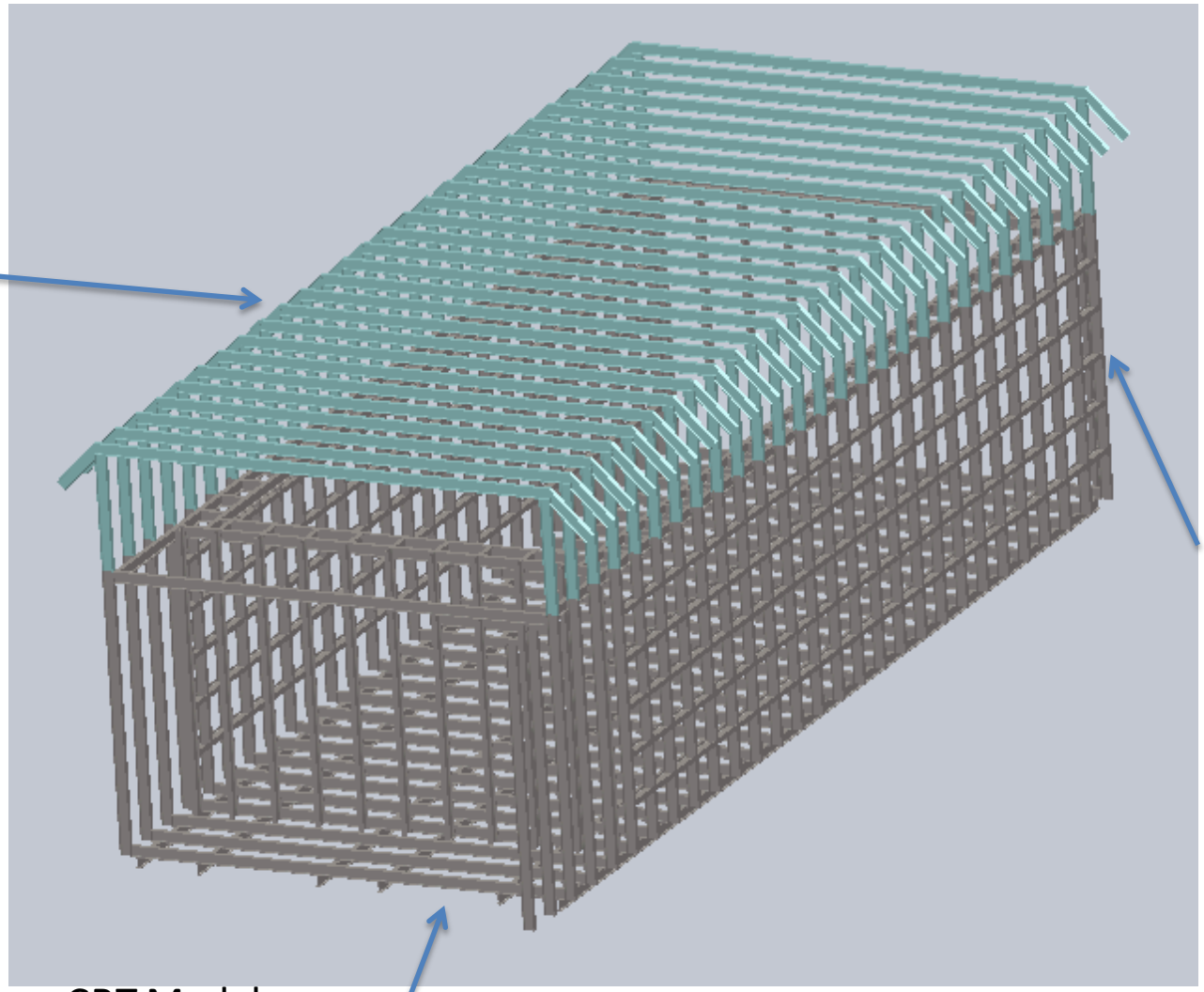


Scintillator bar
Assembly at CSU
For T2K ND-280

Assembled CRT Module



CRT Modules mount to Warm Vessel

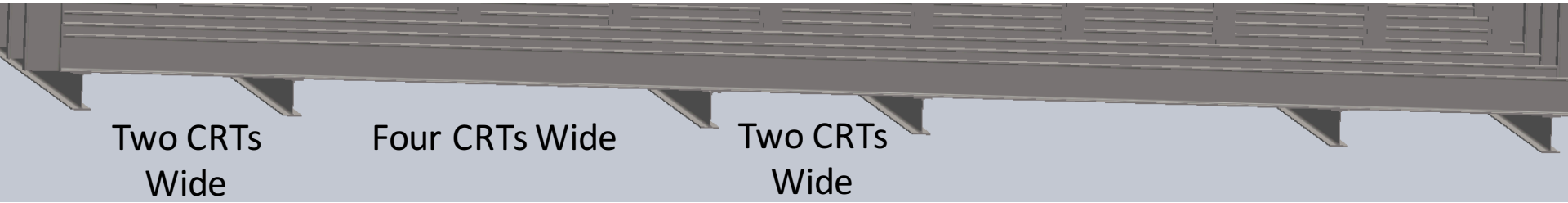


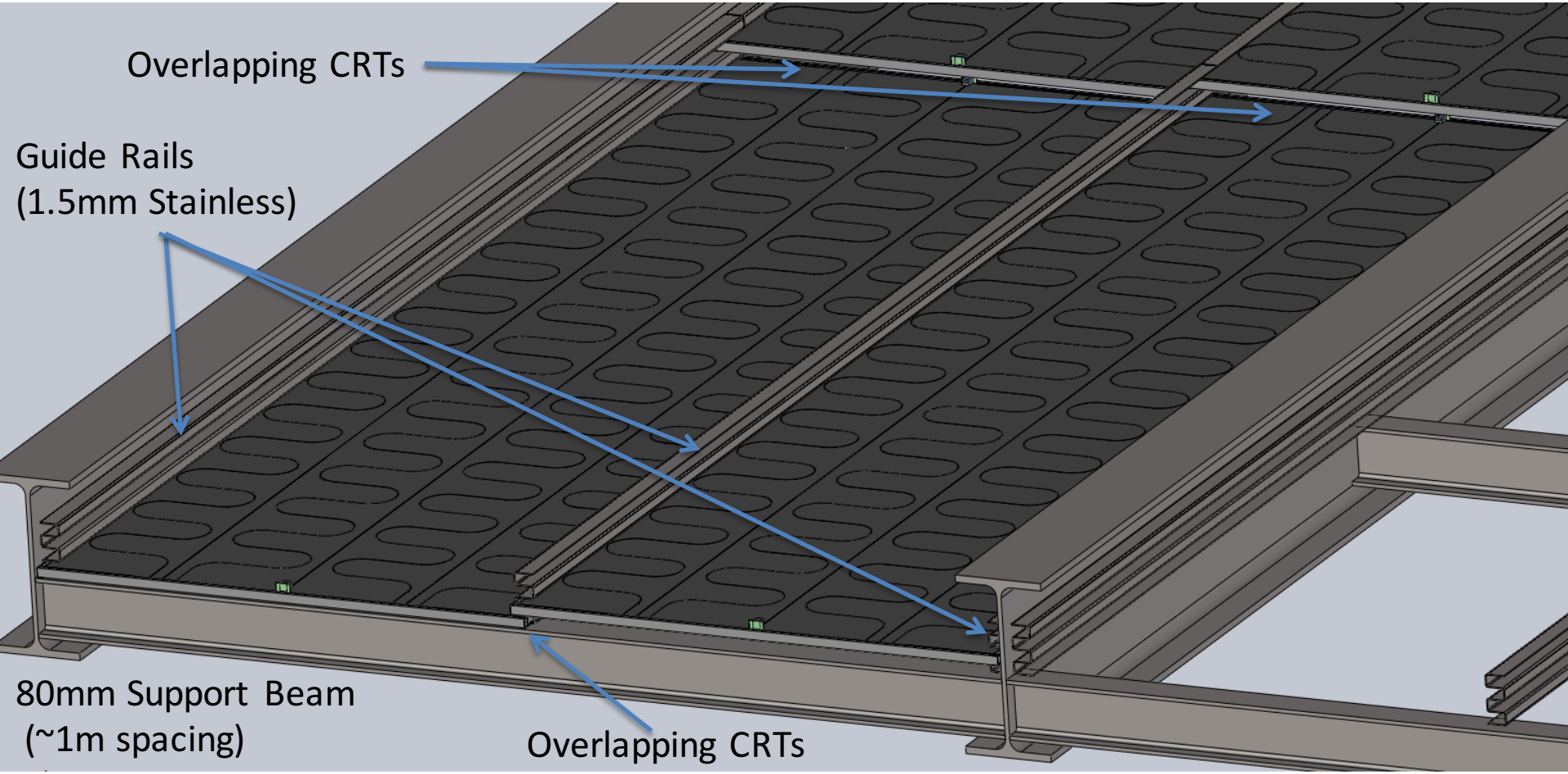
Top CRTs
Mount to
Top Frame

Side CRTs
Mount to
Warm Vessel
Side Beams

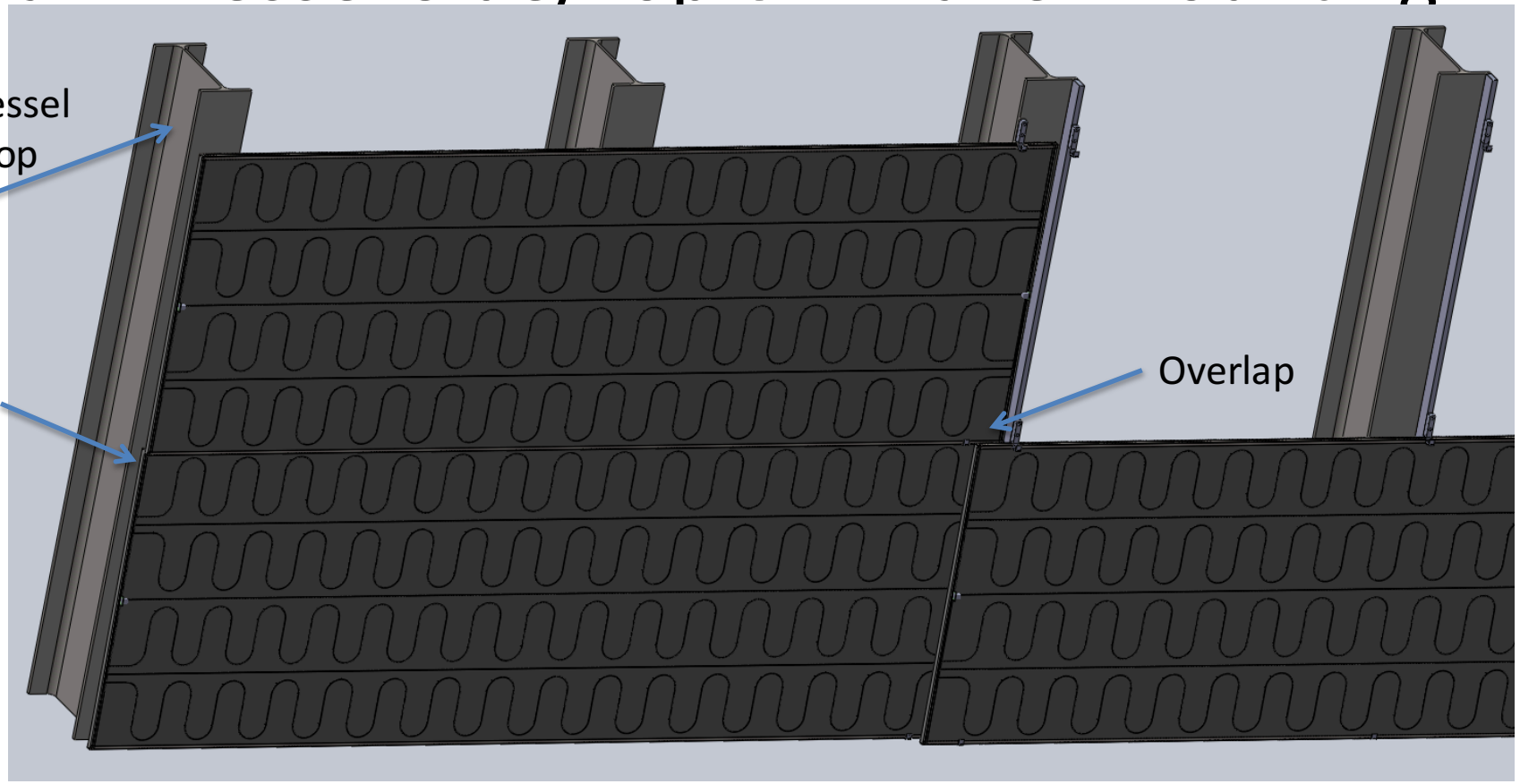
Bottom CRT Modules
Slide under Warm Vessel

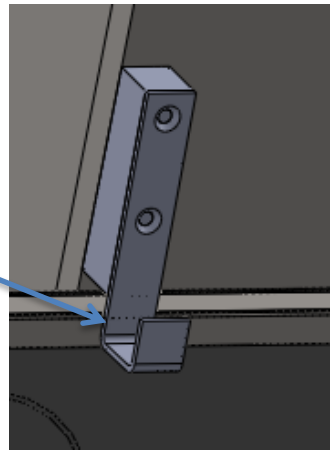
Under Warm Vessel CRT Module Mounting

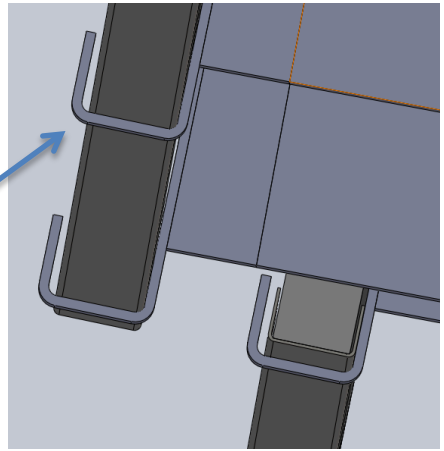




Warm Vessel Side/Top CRT Panel Mounting







Summary

- Side and top CRT panels mount to outside of warm vessel structure
  - Panels overlap in both directions
  - ~1% dead area
- CRT panels under the warm vessel are supported by rails mounted to support beam
  - Panels overlap in both directions
  - ~3% dead area due to support beams and structure
- All panels may be installed after warm vessel installation
- ~900 panels required for full coverage