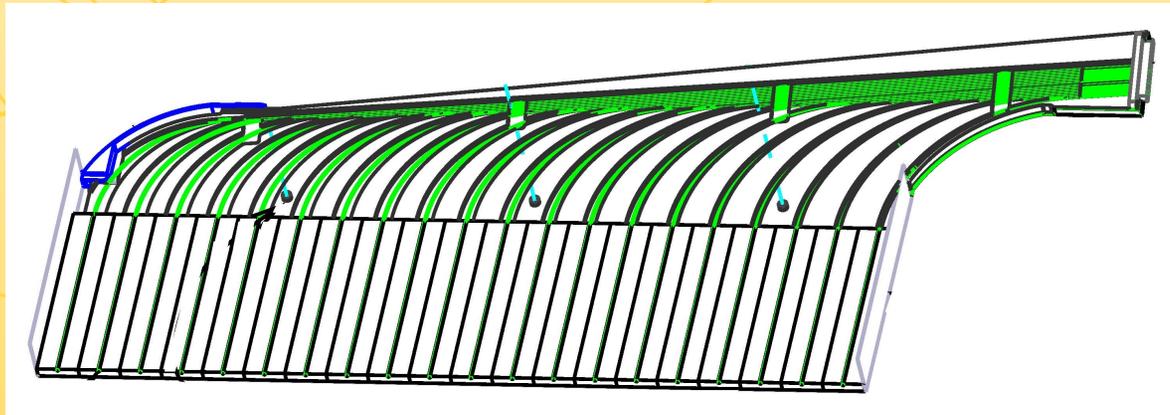


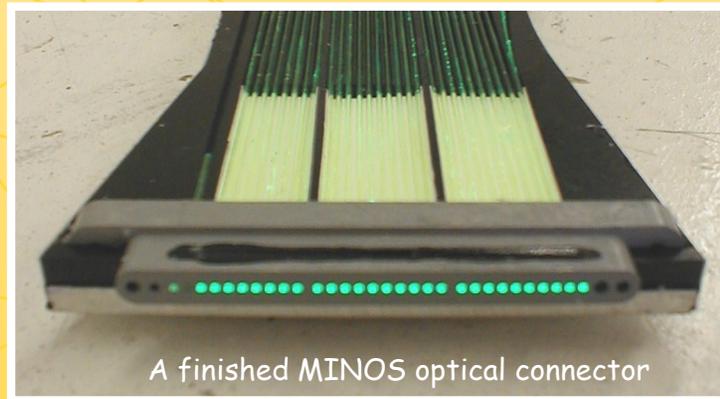
TMS Modules: Exploiting MINOS Designs



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March 2, 2023

Contents

- Brief review of MINOS far detector architecture
- Brief review of MINOS manufacturing methods
- Innovations for adapting MINOS to TMS



A finished MINOS optical connector



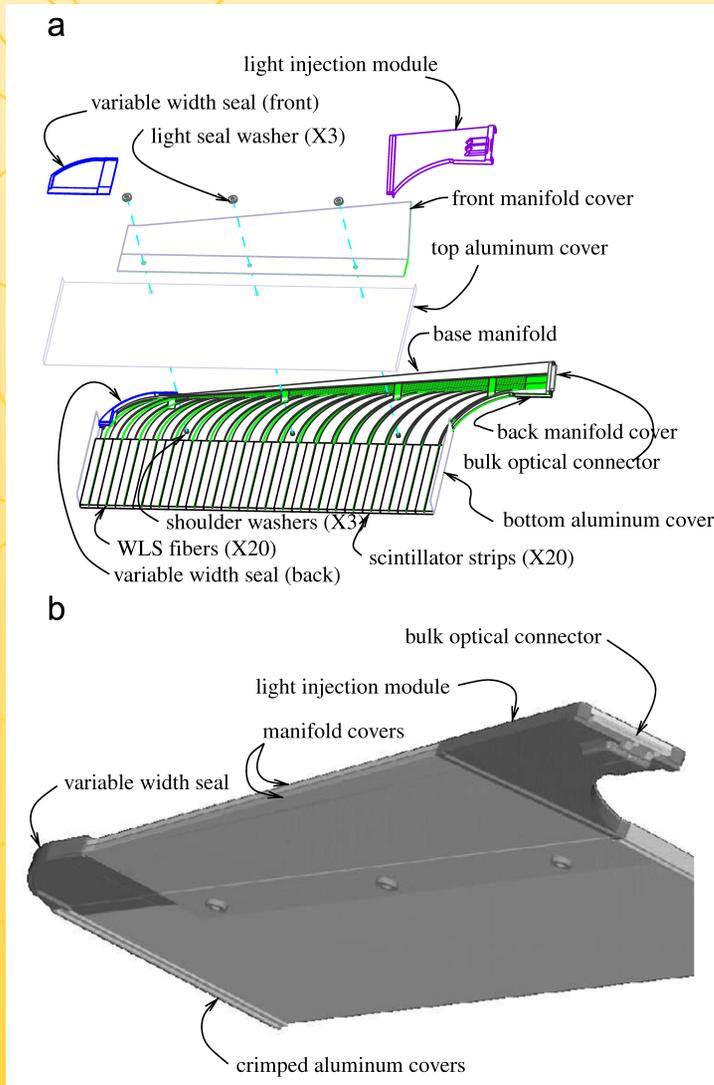
MINOS Scintillator Plane



- Scint bars assembled into “modules”
- 8 modules cover one far detector steel plane
(192 strips per plane)



MINOS Module Manifold



from NIM A 596:2 (2008)

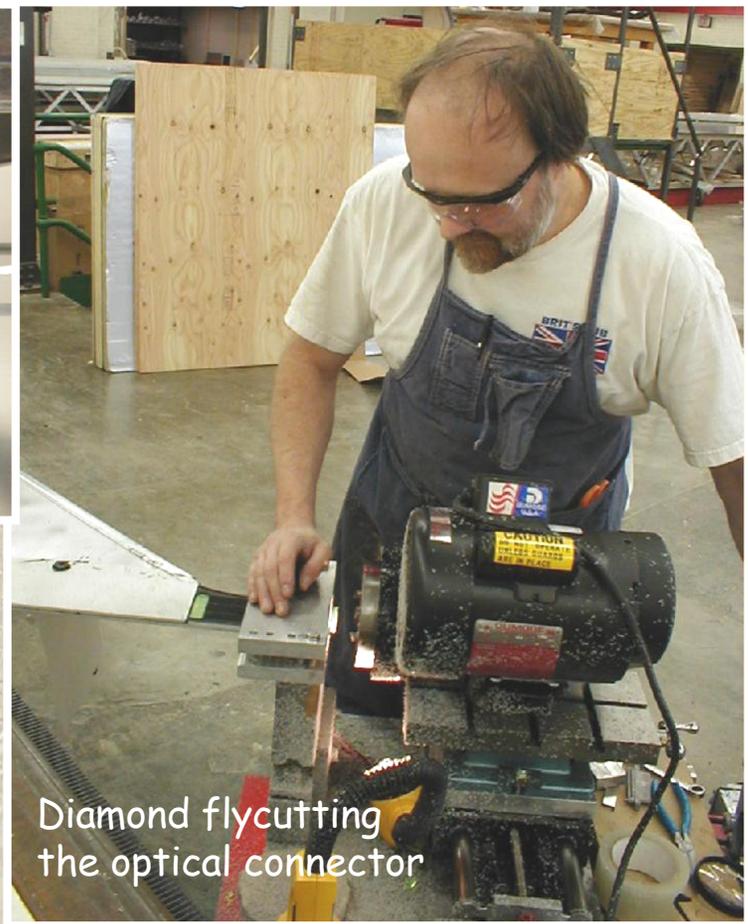
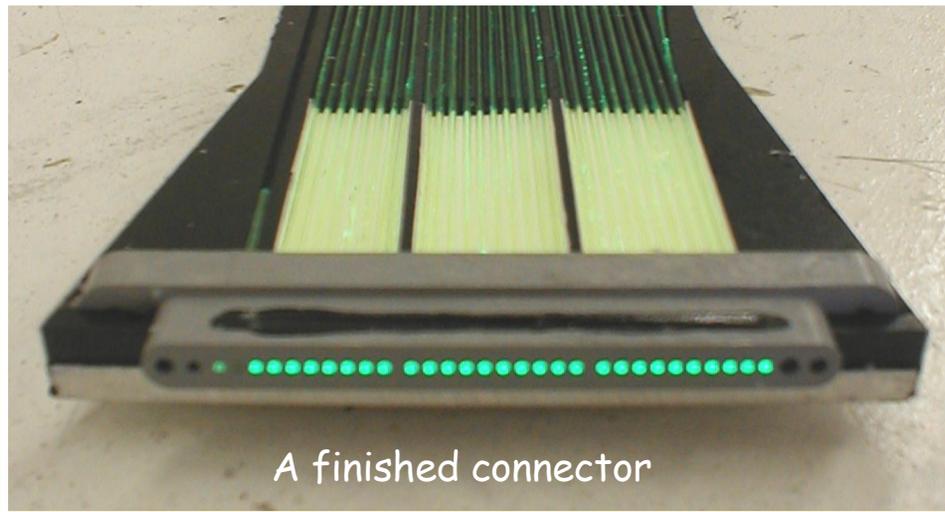
Scenes from **Module** Assembly I



Module Assembly II



Module Assembly III



Light Case Crimper Video

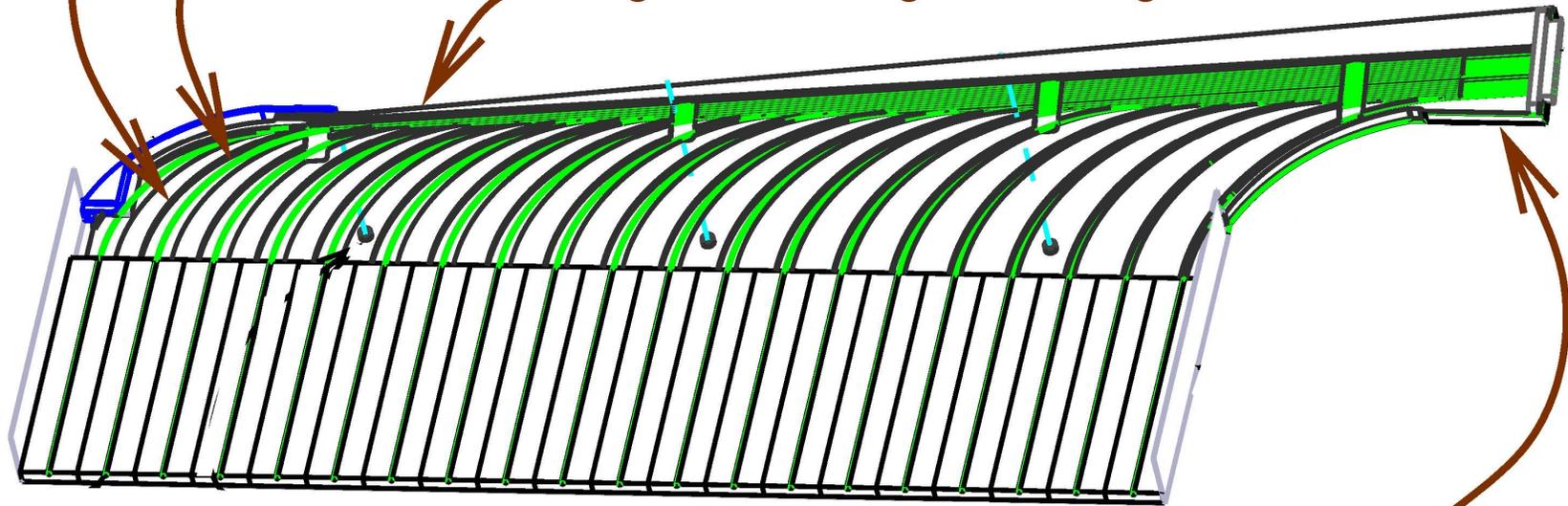


TMS Module Concept

Graduated fiber slots accommodate extrusion tolerances

Fiber bend radius is fully controlled

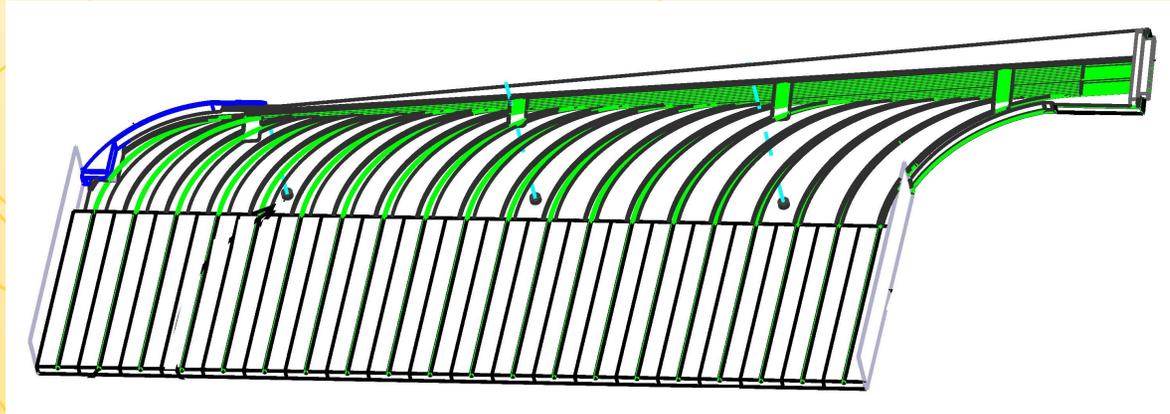
Single < 90 deg bend is gentle on fibers



"Snouts" are nested

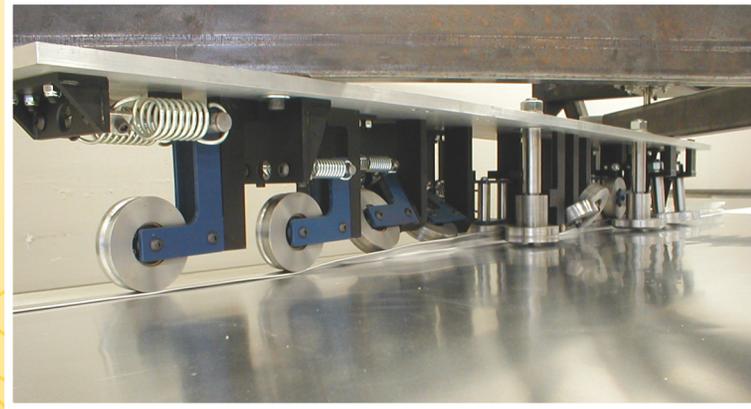


TMS Module Proposal



- 32 scint bars/module = 1120 mm (44") wide (MINOS 45 deg modules were 1150 mm wide) (48 bars leads to awkward 1680 mm (66") width)
- 6 modules/plane
- Only one fiber tray per module
- No shimming required

Crimped Light Case



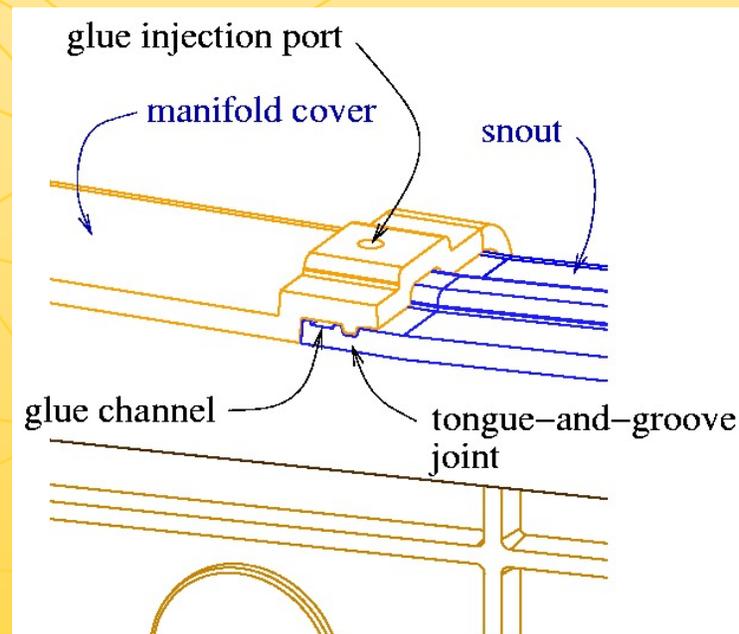
Benefits Over Taping:

- No need for access to bottom of module
- No sharp edges to tape
- No chance of light leakage at “glitches”
- Faster (= lower cost)



Worried about light leaks?

- TMS Innovation: Extend light case over manifold & eliminate many parts & seams
- We can apply our *NOvA Injectible Glue Joint* innovations at the seams



NOvA Connector Flycutter

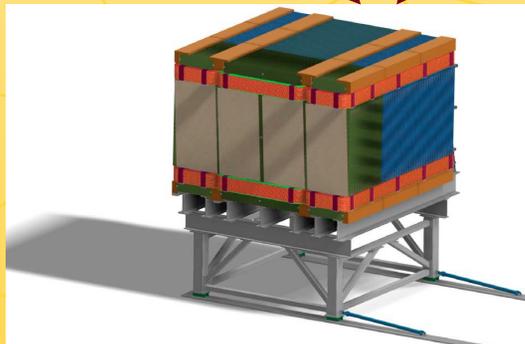


*3D camera automatically aligns
flycutter to optical connector*

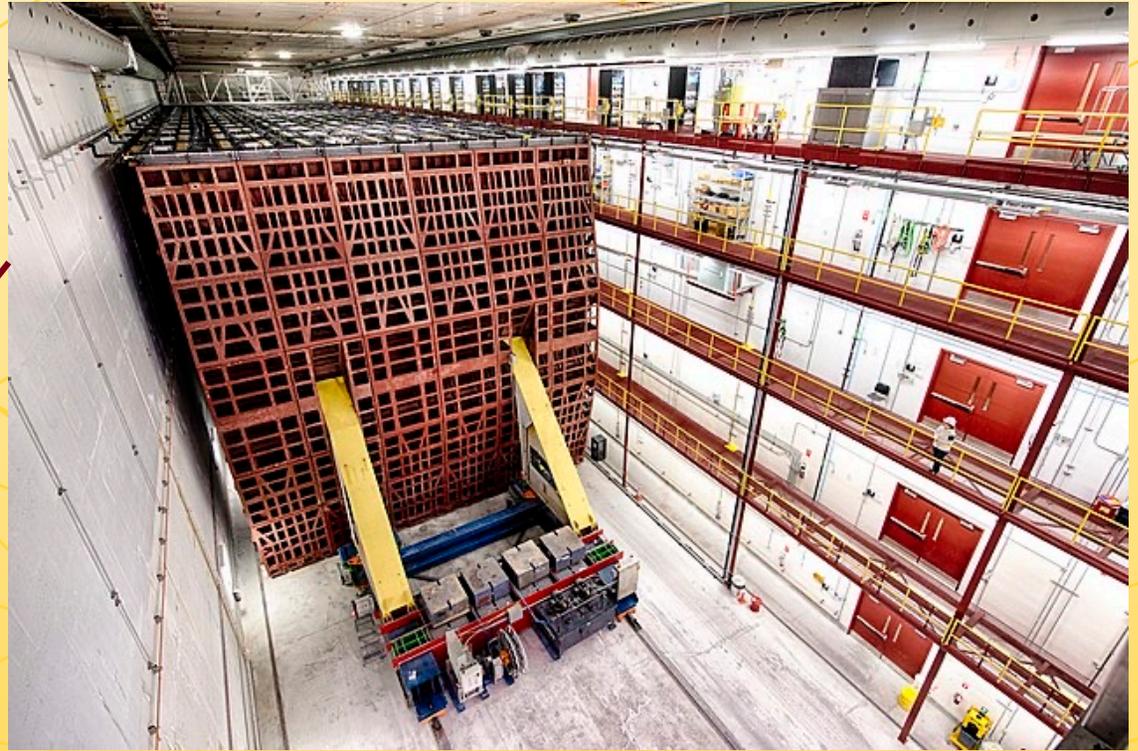
TMS: the Best of Both Worlds



MINOS



TMS



NOvA