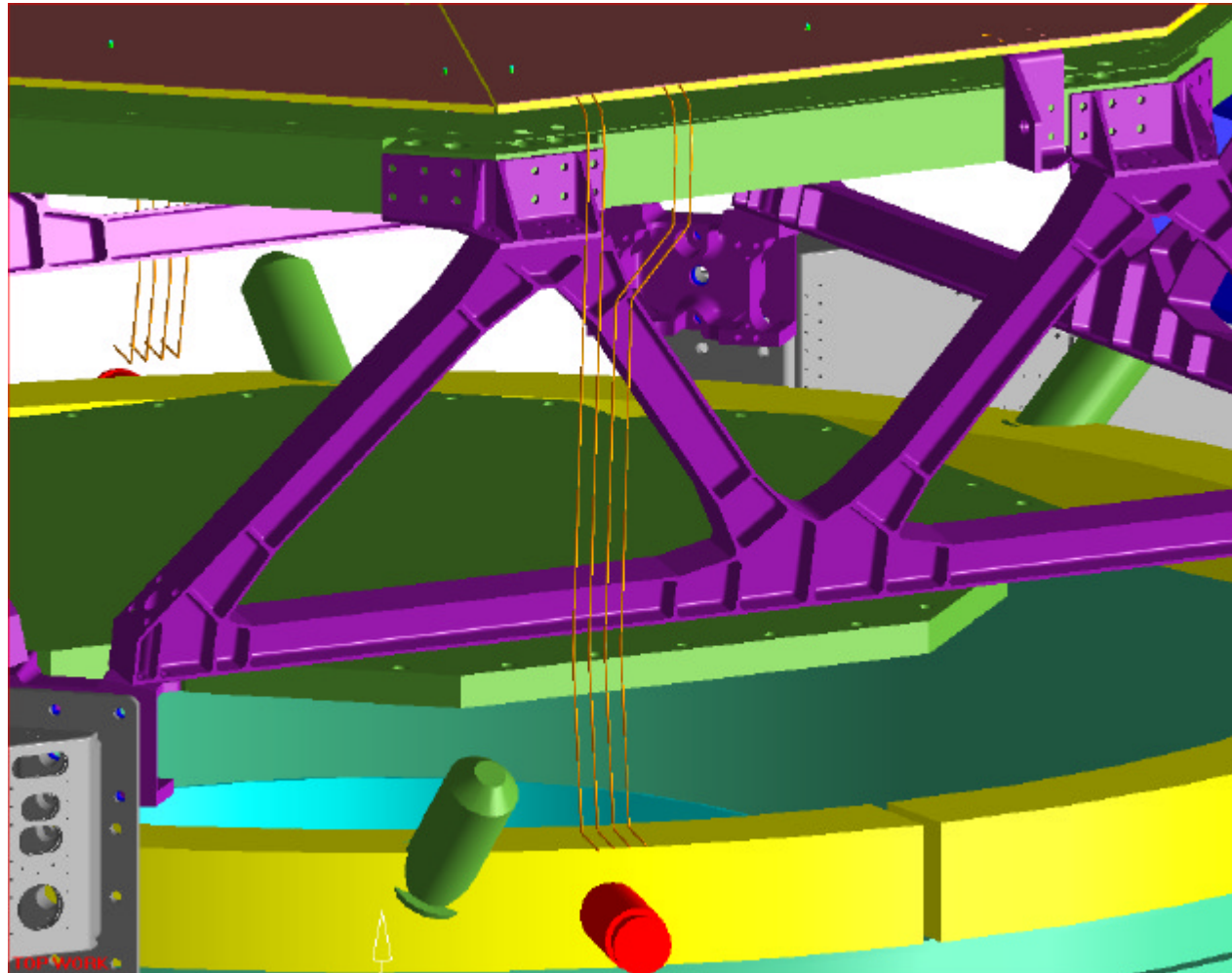

AMS 02 - Thermal Hardware Design Update

- LHP Fluid Line Routing
- Zenith Radiator
- LHP Hardware Issues
- Tracker Radiators
- Crates Radiators
- White Paint

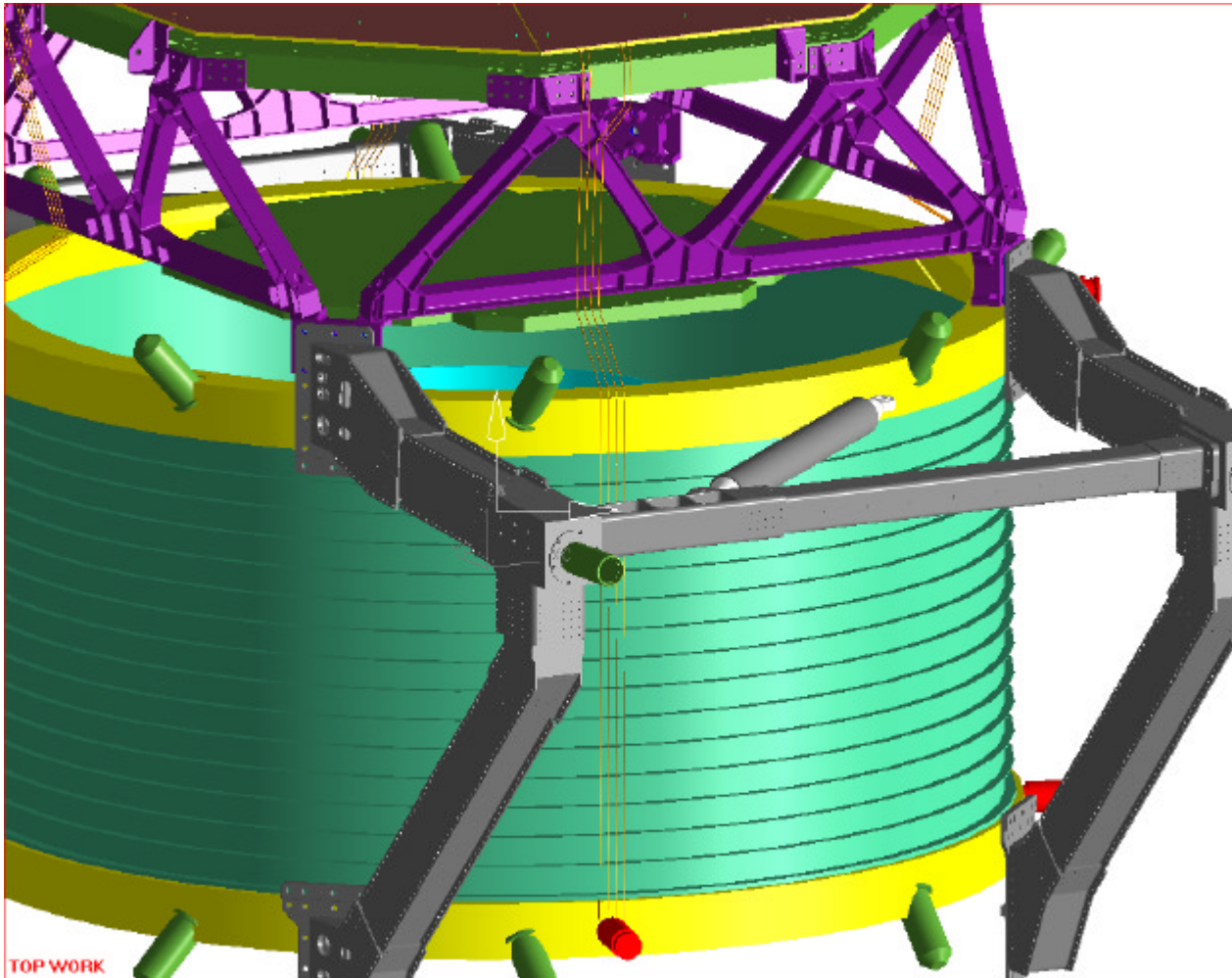
Cryo-Cooler Thermal Control

- LHP Fluid Line Routing
 - GSFC CAD Model received / transfer into reduced model etc. to be finalized in the course of this meeting
 - First idea for fluid line routing --> see next slides
 - We need clear definition of components, which could obstruct routing path
 - 1 meter free tubing --> 8.3 Hz / as consequence tubing must be supported appr. every 300 mm (on M-Structure and Vacuum Case)
 - Low conductivity supports (TBD) / cut out in MLI



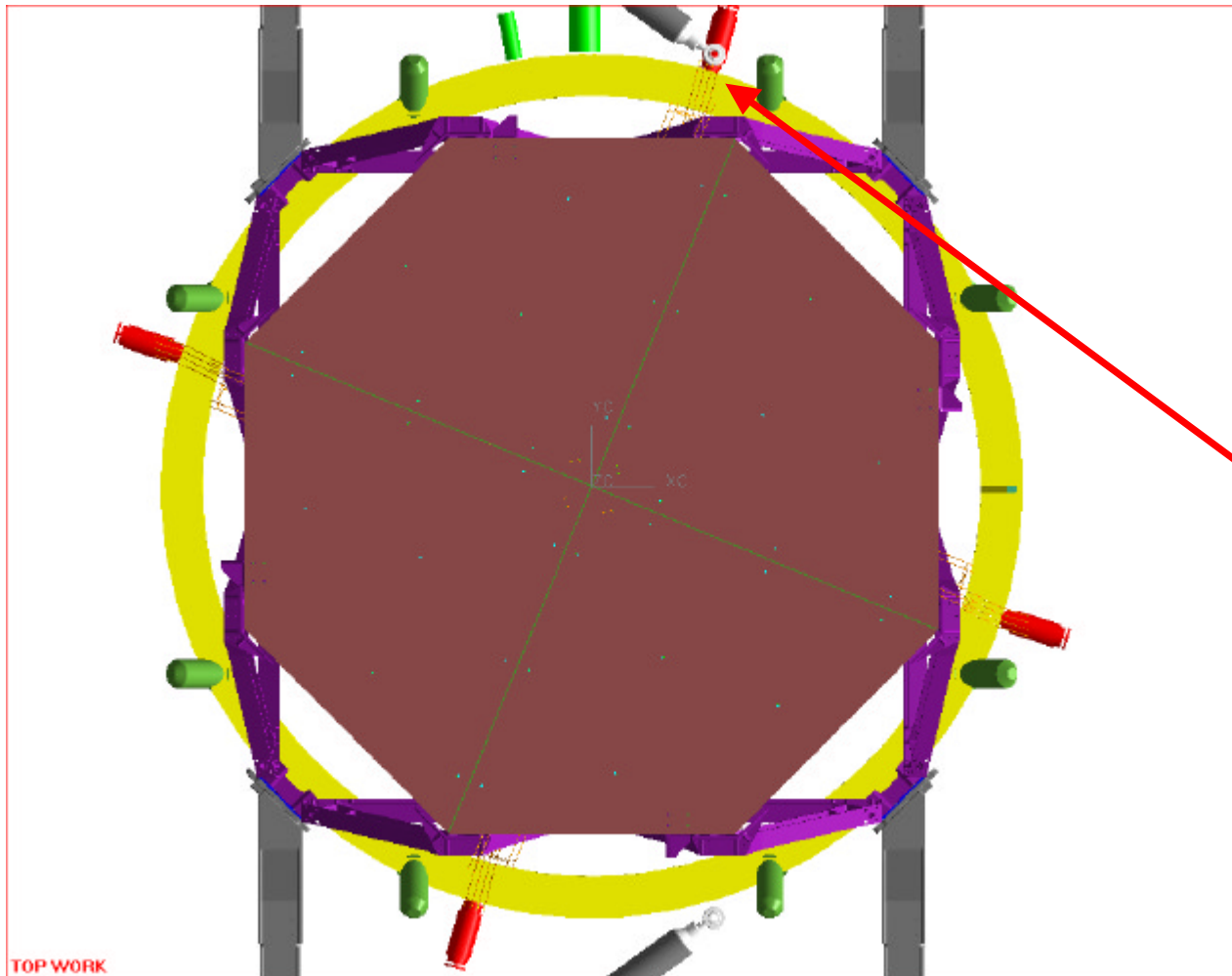
Cryo-Cooler Thermal Control

Routing to upper
Cooler

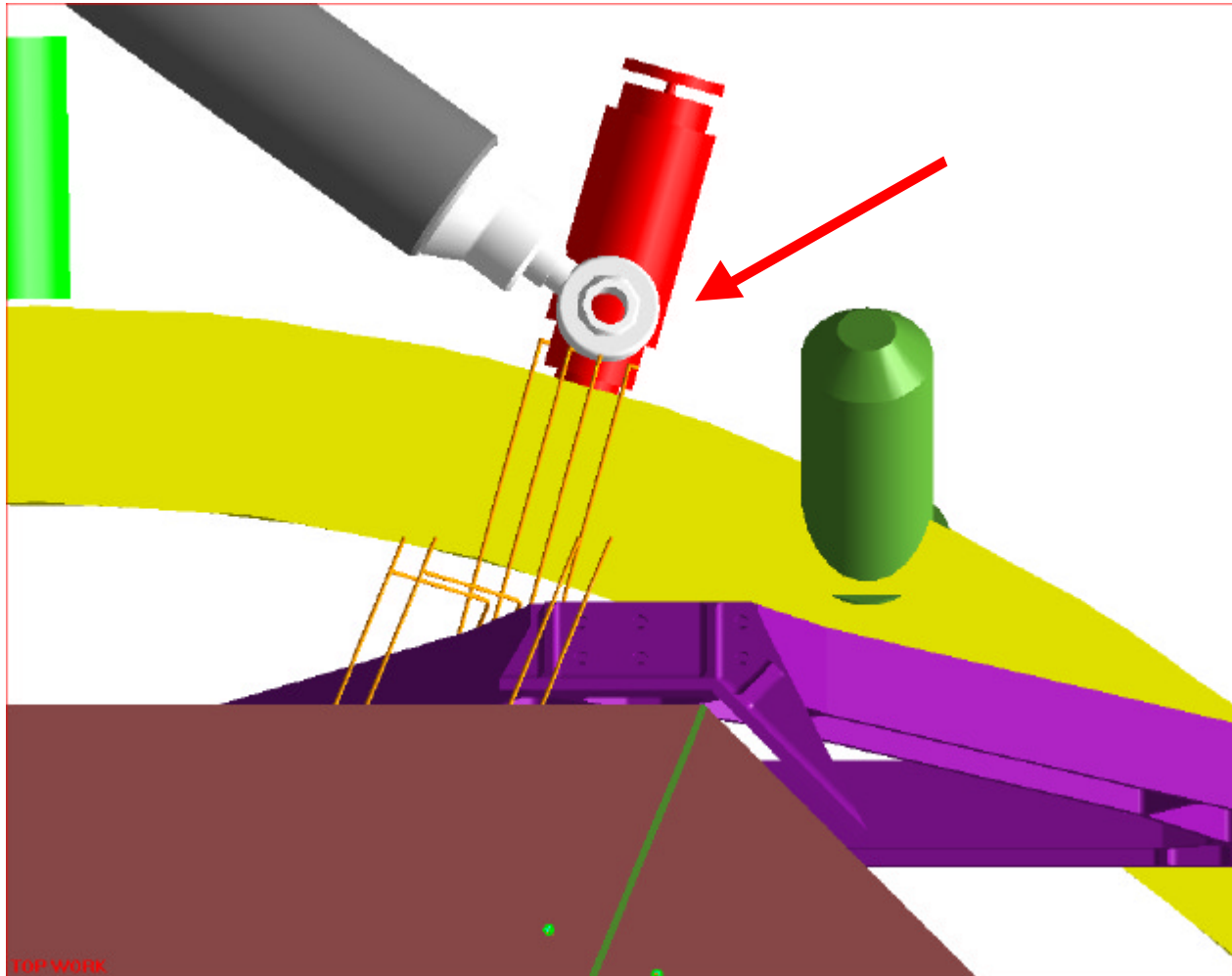


Cryo-Cooler Thermal Control

Routing to lower
Cooler



Cryo-Cooler
Thermal
Control
Interference with
strut
(to be solved)



**Cryo-Cooler
Thermal
Control**
Interference with
Strut
(to be solved)

Cryo-Cooler Thermal Control

- Zenith Radiator
 - Detailed analysis will start in January 2003
 - Analysis to be based on interfacing algorithm (LHP / ESATAN) developed for ESA
 - Decision to use radiator enlargement (by surface of formerly TRD ring radiator) will be done based on detailed analysis
 - Mechanical design / mounting to TRD presently unchanged / will be updated and confirmed during detailed thermal design phase

Cryo-Cooler Thermal Control

- LHP Hardware Issues
 - **Soldering**
 - Three different soldering samples (Al-tube to AL-face sheet) are under manufacturing in Moscow
 - Results in CW 1, 2003
 - **Pitting Corrosion**
 - Was discovered in and is unique to TPX experiment (see E-mail)
 - Qualified processes exist at LHP manufacturer to avoid corrosion
 - OHB will prepare a proposal for accelerated life testing on representative samples (need to be decided by materials people)

Tracker Radiators

- Detailed analysis starts in February 2003
- Lay out as previously presented (parallel heat pipes), but possibly separate brackets to USS
- NLR to confirm condenser interface
- Radiator needs MLI on back side
- Installation of hardware on AMS as late as possible, i.e. after TRD MLI and LHP integration (see Chr. Vettore presentation)

Crates Radiators

- Detailed thermal/structural analysis starts in February 2003 based on work performed to date by CGS
- Preliminary version of heat pipe lay out discussed with CGS
- Radiator MLI on back side under discussion (trade with MLI on vacuum case)
- Installation of hardware on AMS as late as possible to facilitate integration of other subsystems (see presentation on integration)

White Paint

- SG121FD has been successful tested for atox aging with a fluence of 2.1020 at/cm², which simulates 4 years in 700-800 km orbits, which does not present a 5 years mission on ISS
- However, results are identical with former paints SG120FD and PSG120FD
- CNES recommends to accept paint SG121FD paint by similarity with SG120FD and PSG120FD
- See e-mail by Dr. Stéphanie Remaury, CNES