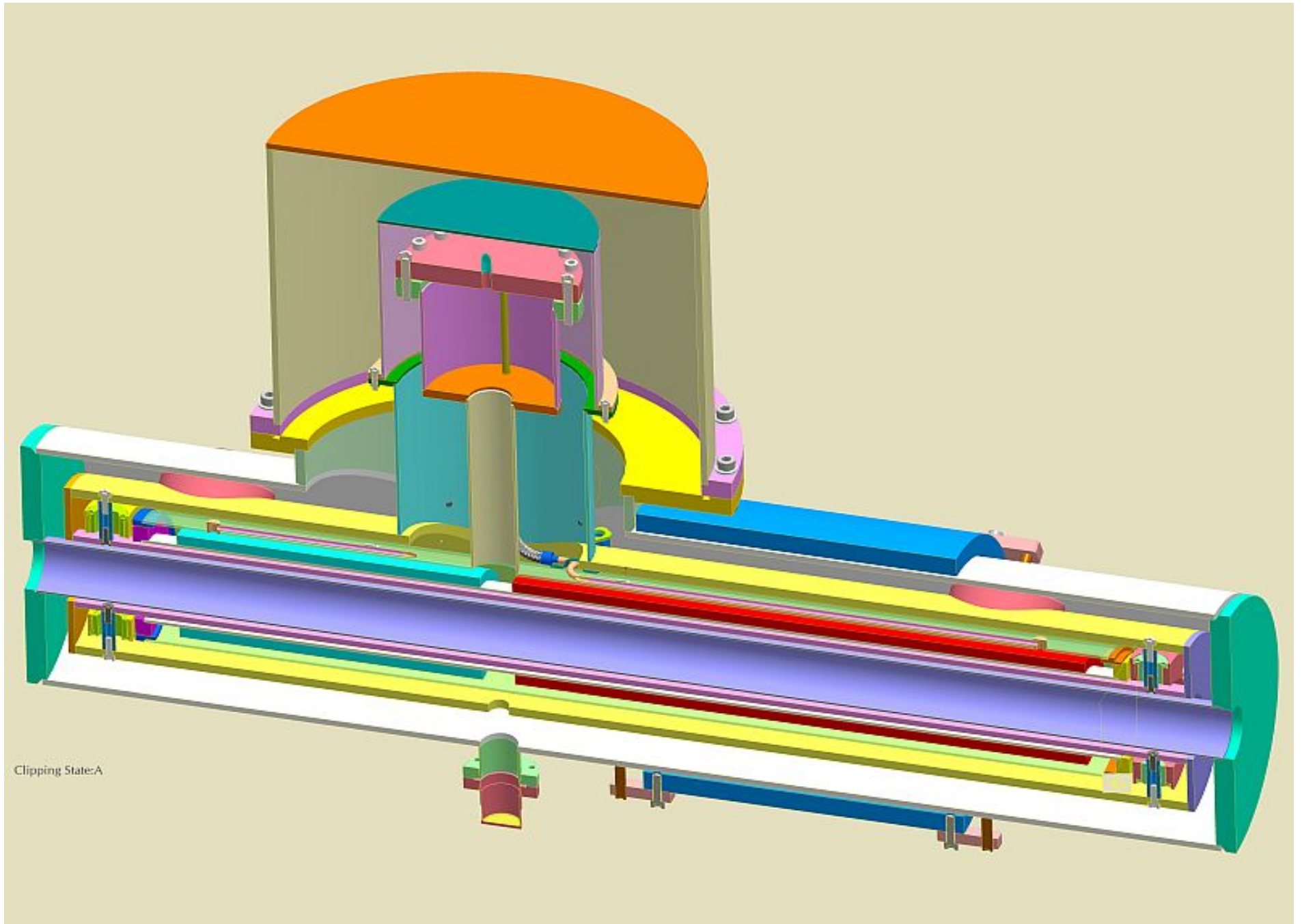


# ATF-2 MAGNET CRYOGENIC DESIGN SUMMARY

June 14,2010



Clipping State:A

# Coil Summary

- **Quad Coil Set**
  1. QDO -6 layers cable
  2. Dipole corrector- 1 layer wire
  3. Skew Dipole corrector- 1 layer wire
  
- **Sextupole Coil Set**
  1. SDO- 4 layers cable
  2. Skew Sextupole corrector- 2 layers wire
  3. Quad corrector- 2 layers wire
    - May be changed in favor of Octupole
  4. Skew Quad corrector- 1 layer wire

# Lead Summary

- **Quad Coil Set**
  1. QDO – (2) 300 Amp leads
  2. Dipole corrector- (2) 20 Amp leads
  3. Skew Dipole corrector- (2) 20 Amp leads
  
- **Sextupole Coil Set**
  1. SDO- (2) 300 Amp leads
  2. Skew Sextupole corrector- (2) 20 Amp leads
  3. Quad corrector- (2) 20 Amp leads
  4. Skew Quad corrector- (2) 20 Amp leads
  
- **Totals**
  1. (4) 300 Amp Leads
  2. (10) 20 Amp Leads

# Instrumentation Summary

- **Quad Coil Set**

1. QDO – (8) V-tap leads, (6) heater leads
2. Dipole corrector- (6) V-tap leads, (4) heater leads
3. Skew Dipole corrector- (6) V-tap leads, (4) heater leads

- **Sextupole Coil Set**

1. SDO- (6) V-tap leads, (4) heater leads
2. Skew Sextupole corrector- (6) V-tap leads, (4) heater leads
3. Quad corrector- (6) V-tap leads, (4) heater leads
4. Skew Quad corrector- (6) V-tap leads, (4) heater leads

- **Totals**

1. (44) V-tap Leads
2. (30) heater Leads

# Preliminary Heat Load To Cold Mass

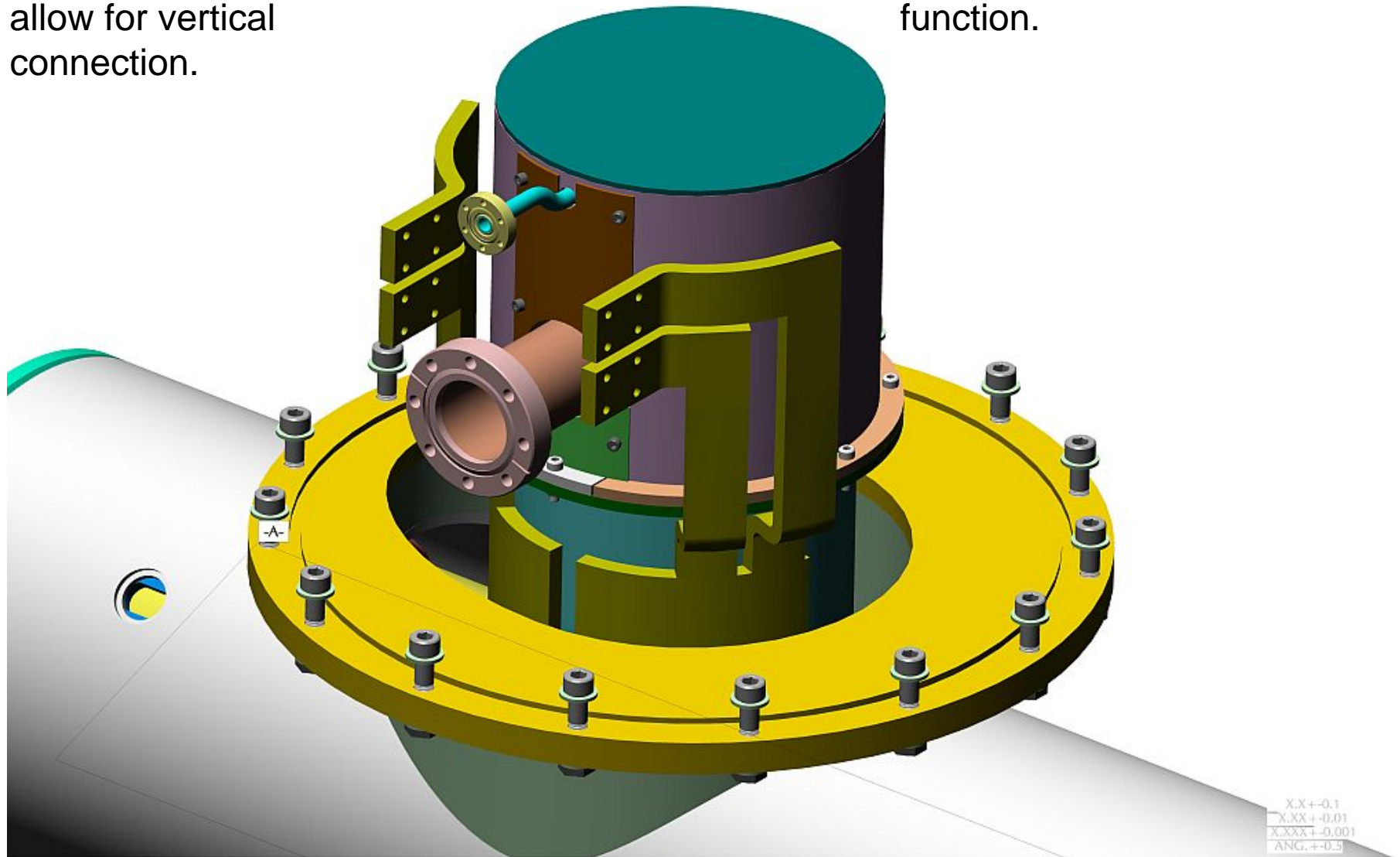
1. 4K Operation (80K) heat shield
  - About 2.5 Watts (Lower heat shield temp will lower heat load somewhat)
2. 2K Operation, (5K) heat shield
  - < .35 Watts

# Support Tube Stresses

- Components
  1. From 75 psi external pressure- (1200 psi)
  2. From 25 lb. wrap (cable coils)- (3825 psi)
  3. From 20 lb. wrap (wire coils)- (3050 psi)
- Total Stresses (compressive)
  1. Quad set – (11,900 psi)
  2. Sextupole set – (14,175 psi)

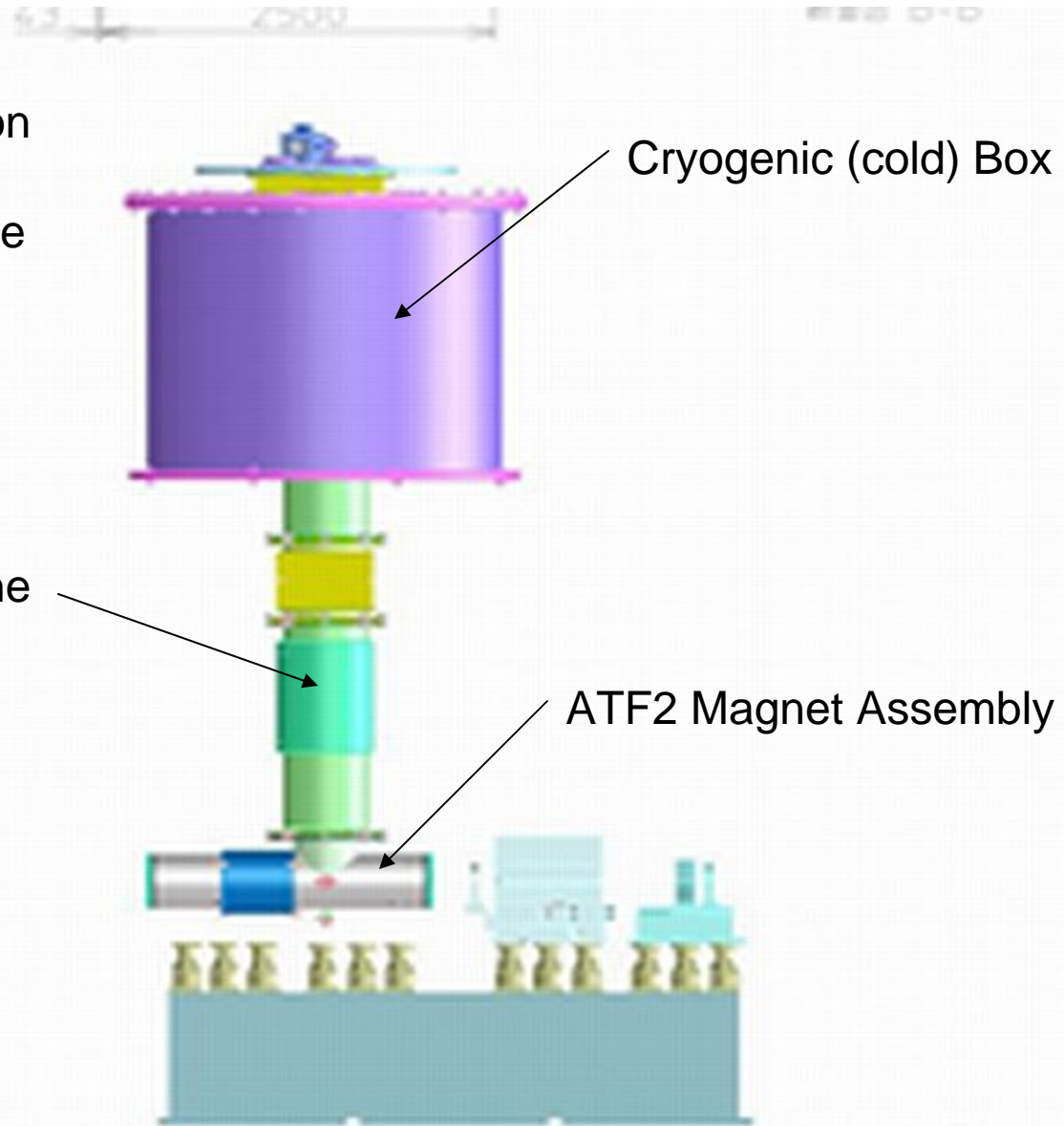
Some interface adapter would be required to preserve this function and allow for vertical connection.

Horizontal connection to service cryostat to simulate full size ILC connection and function.

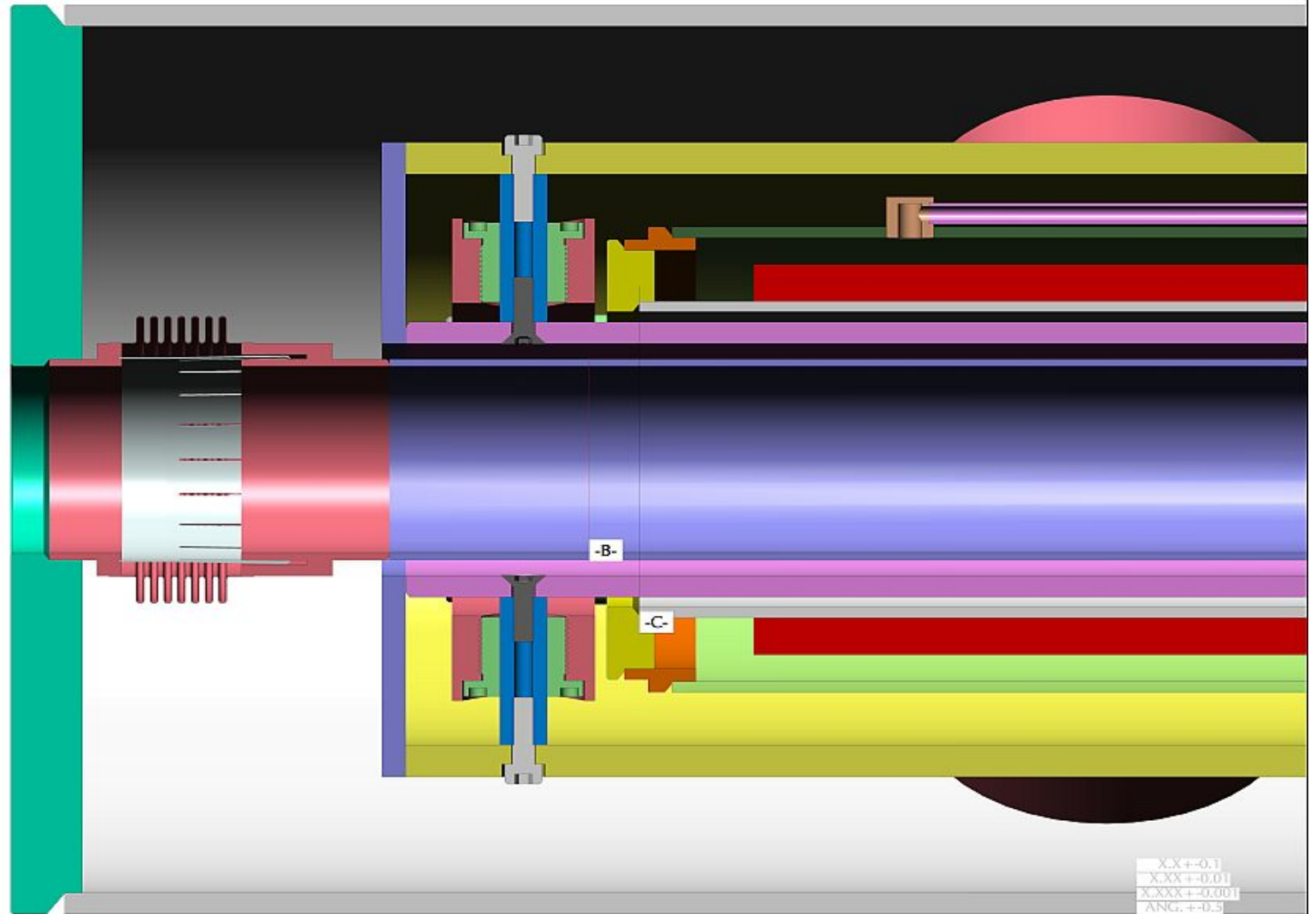




Due to the large size of the present configuration of the KEK Cryo box, a special support structure would be needed for testing at BNL.



Inner support design simulates full size ILC method, heat load to 4K with 80K shield temp is about 2.5W. KEK providing 2.6W for operation?



Clipping State:VERT

# CERTIFICATION

- Present design based on ASME Code.
- Local TUV Certification firm (TUV Rheinland) contacted, no further action to date.