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-LIGO-
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SLC Manifold/Cryopump Baffle Interface Control Document	
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1 Scope

This document describes the interfaces between the Manifold/Cryopump Baffle and the Mode Cleaner Tube Baffles with regard to the physical installation in the vacuum tubes and the optical interfaces with the optical beams in the interferometer.

2 MANIFOLD/CRYOPUMP BAFFLE

2.1 Mechanical Interfaces

The Manifold/cryopump Baffle is shown in Figure 1. The combined baffle consists of an outer cylinder, a cone, an inner cylinder, and an annular baffle plate that are suspended from an outer support ring.

The baffle is mounted inside the manifold tube leading to the cryopump at each end of the arm beam tube, near the A-1 viewport adapters. The support ring is mounted 15.5 in from the inside face of the viewport adapter. The blade springs mount to the outer support ring, which is compressed against the inside surface of the manifold tube, as shown in Figure 2.

The vertex Manifold/cryopump Baffles are mounted inside spool B-9; and the end Manifold/cryopump Baffles are mounted inside the A-7 adapters.

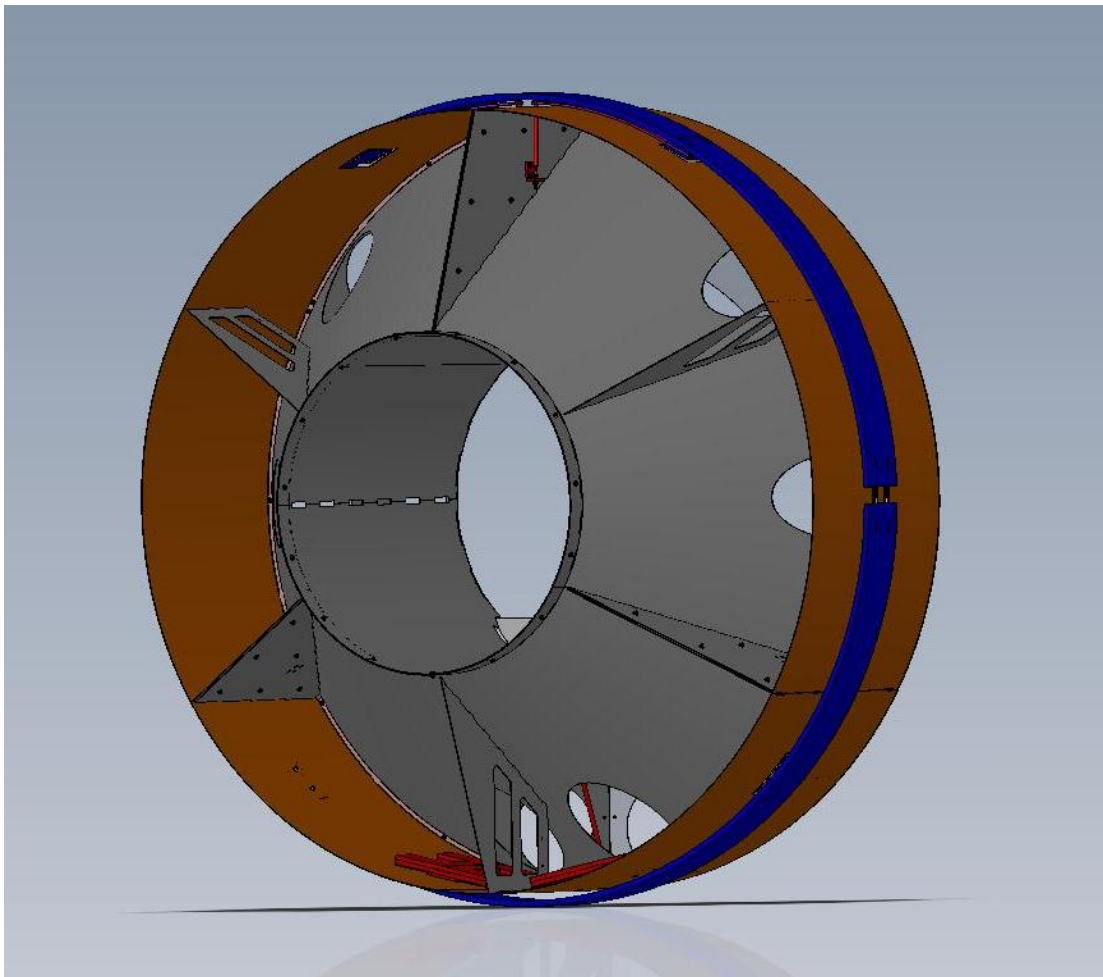


Figure 1: Manifold/Cryopump Baffle as Seen from the Near Test Mass

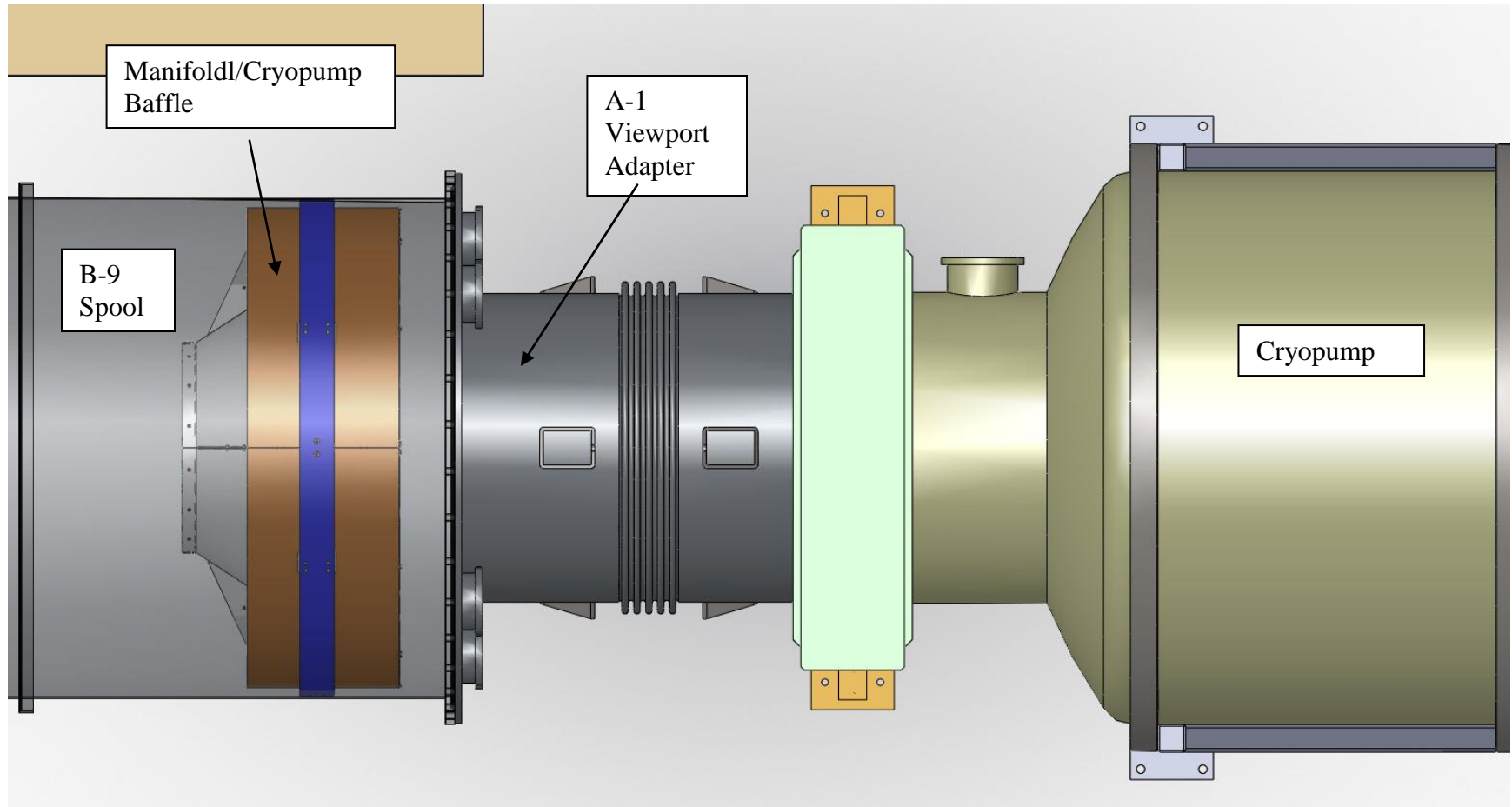


Figure 2: ITMX H1-L1 Manifold/Cryopump Baffle Positioned in the B-9 Spool next to A-1 Viewport Adapter

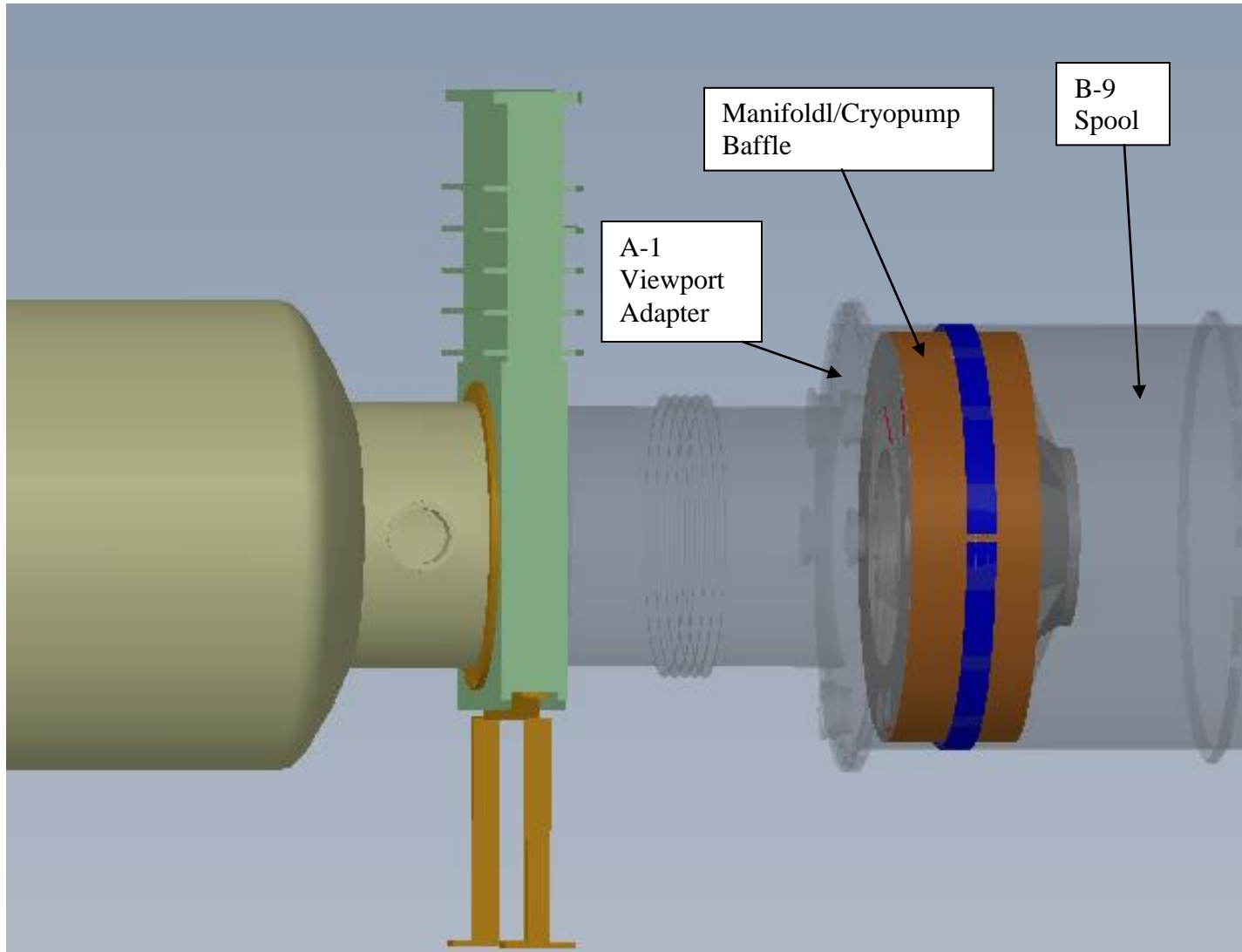


Figure 3: ITMY H1-L1 Manifold/Cryopump Baffle Positioned in the B-9 Spool next to A-1 Viewport Adapter

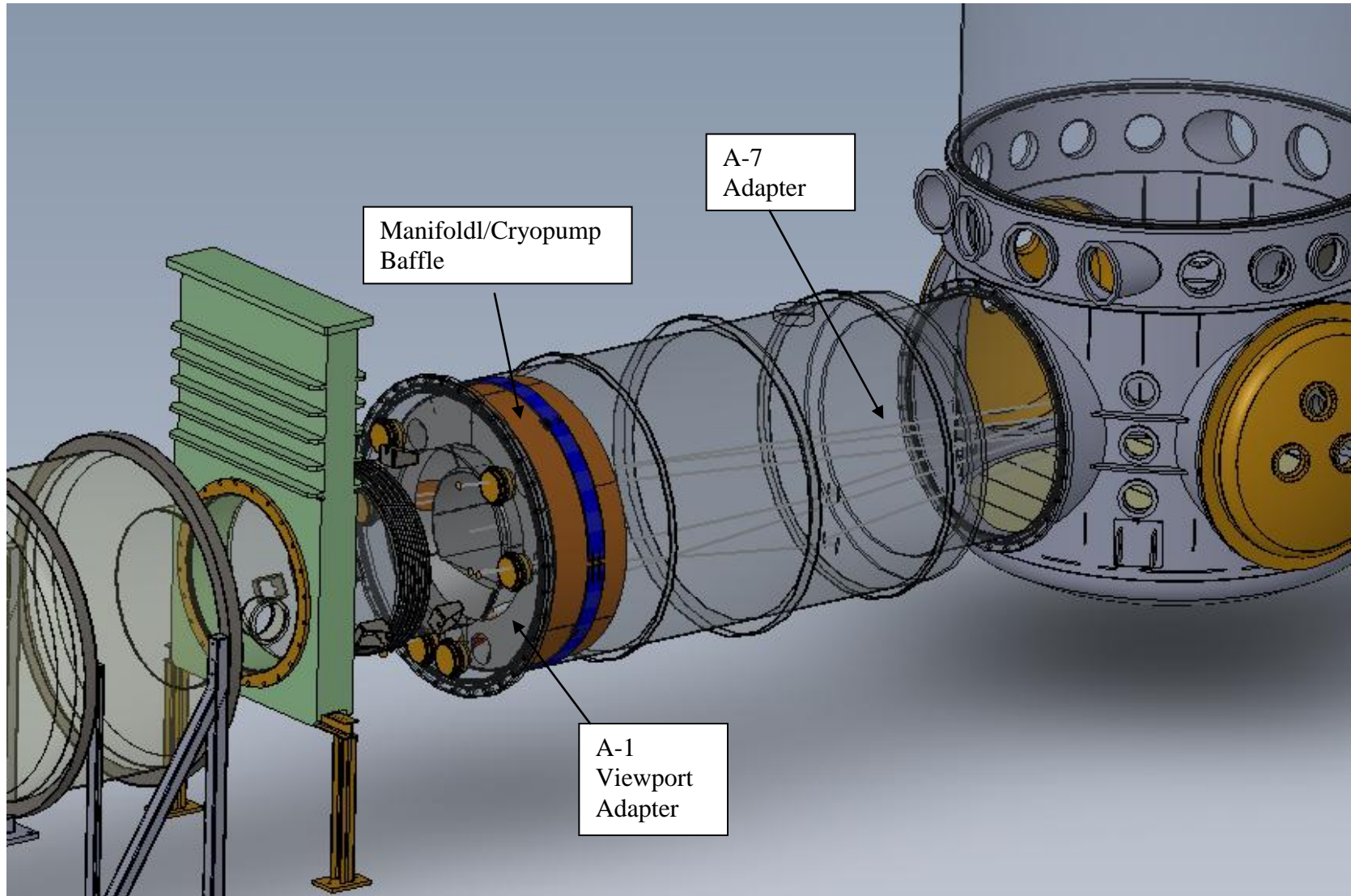


Figure 4: ETMX H1-L1 Manifold/Cryopump Baffle Positioned in Adapter A-7 next to A-1 Viewport Adapter

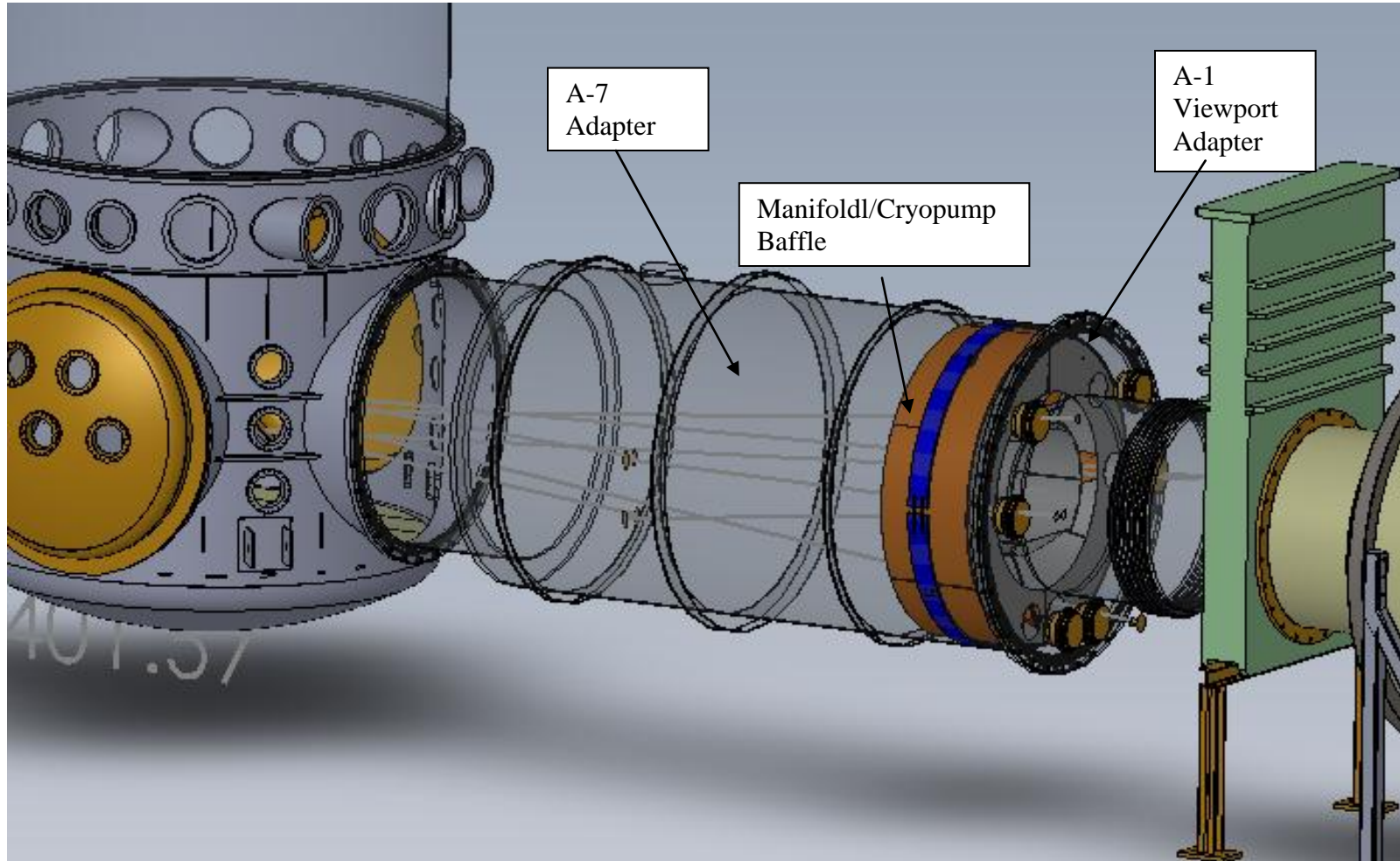


Figure 5: ETMY H1-L1 Manifold/Cryopump Baffle Positioned in Adapter A-7 next to A-1 Viewport Adapter

2.2 Optical Interfaces

2.2.1 *Arm Cavity Beams*

The 769 mm clear aperture diameter of the Manifold/Cryopump Baffle allows the H1 and H2 IFO arm cavity beams— < 327 mm diameter at the 1 ppm diameter—to pass through without vignetting.

2.2.2 *TCS Beams*

The H2 TCS CO2 laser beams that pass through of the clear aperture of the viewports will also pass through the openings in the cone section of the baffle.

2.2.3 *Optical Lever and Photon Calibrator Beams*

The H2 and H1 optical laser beams, and photon calibrator beams that pass through of the clear aperture of the viewports will also pass through the openings in the cone section of the baffle.

2.2.4 *Video Camera Beams*

Video camera beams that pass through of the clear aperture of the viewports will also pass through the openings in the cone section of the baffle.

3 MODE CLEANER TUBE BAFFLE

3.1 Mechanical Interfaces

The Mode Cleaner Baffles are located at both ends of the mode cleaner tubes in the power recycling and signal recycling cavities. They are attached to an outer support ring, placed 6 inches from the viewport adapter plate. The support ring is compressed against the inside surface of the mode cleaner tubes.

The mounting configurations are shown in the following figures.

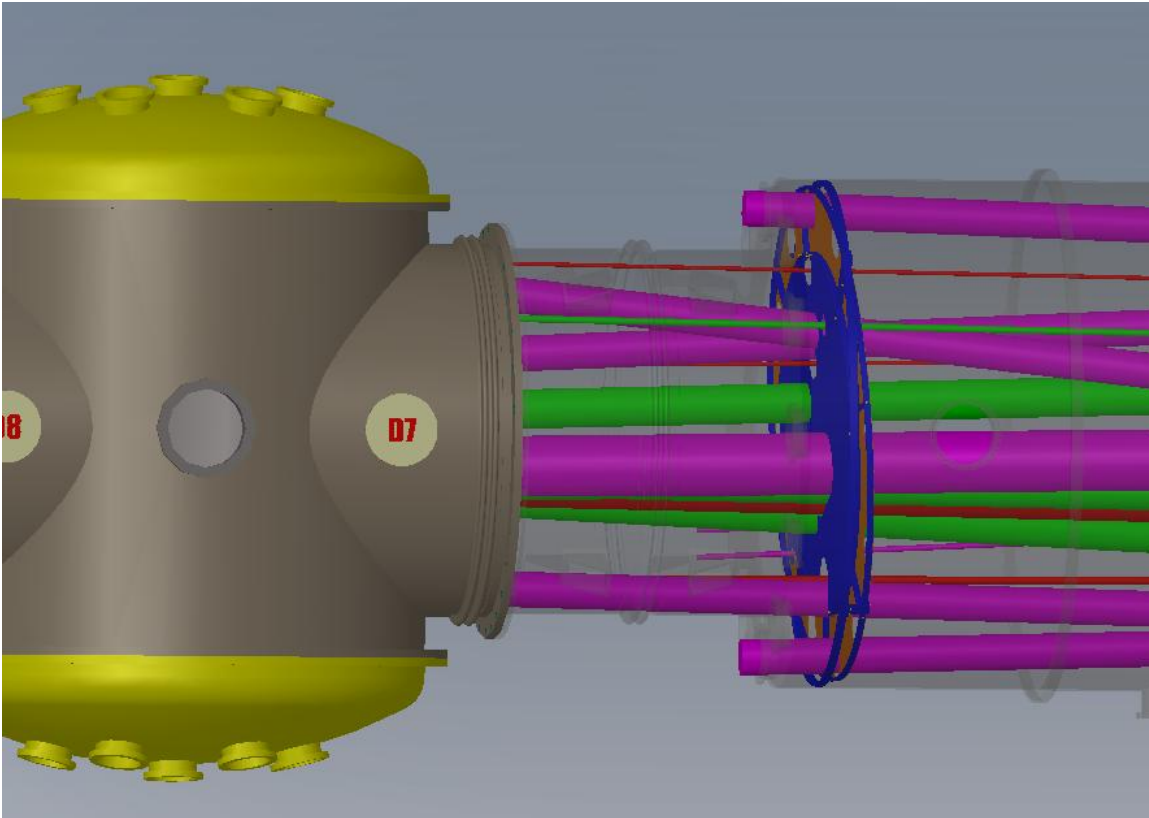


Figure 6: MCA1, H1-L1, HAM2

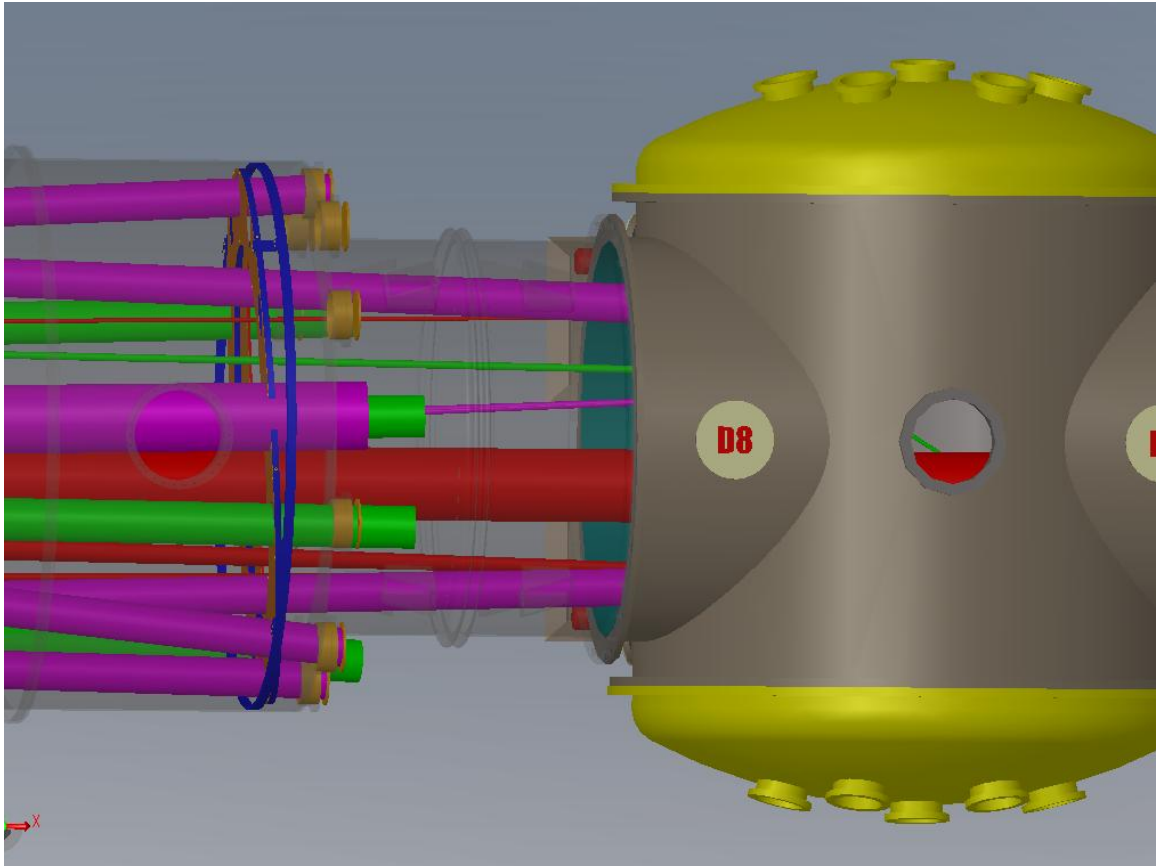


Figure 7: MCB1, H1-L1, HAM3

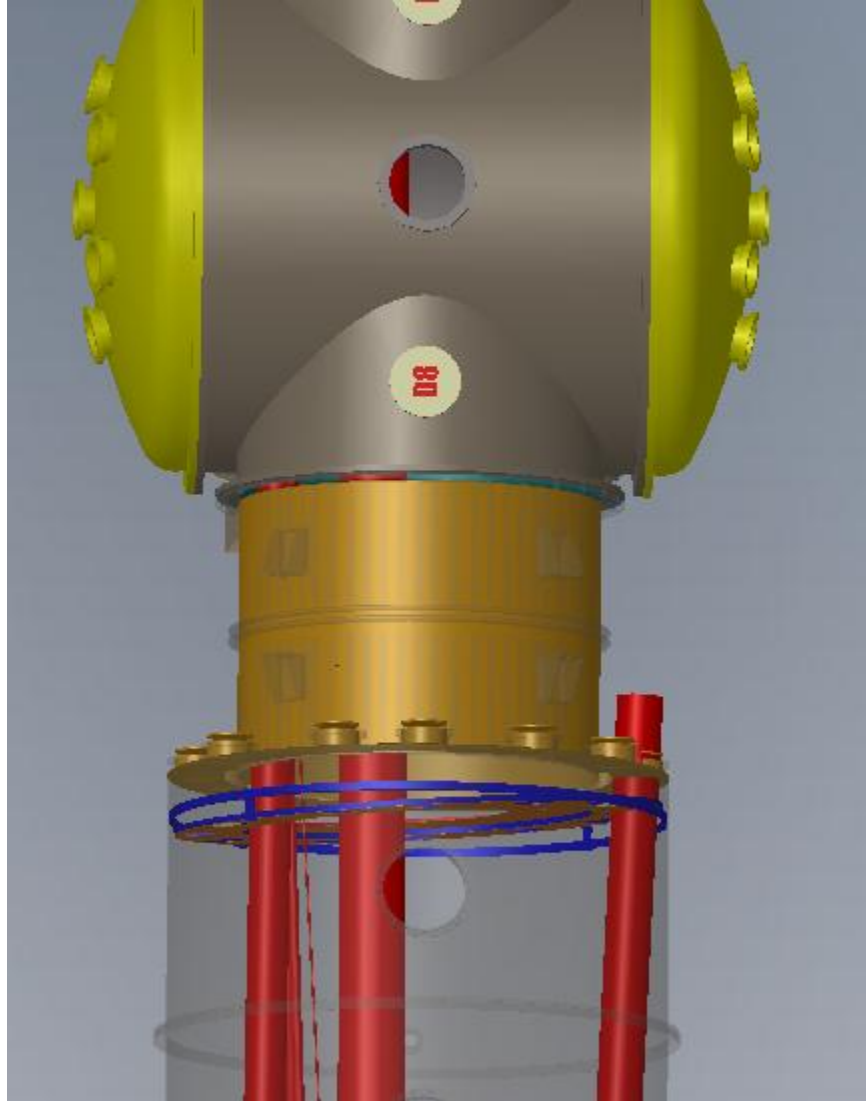


Figure 8: MCB2, H1-L1, HAM4

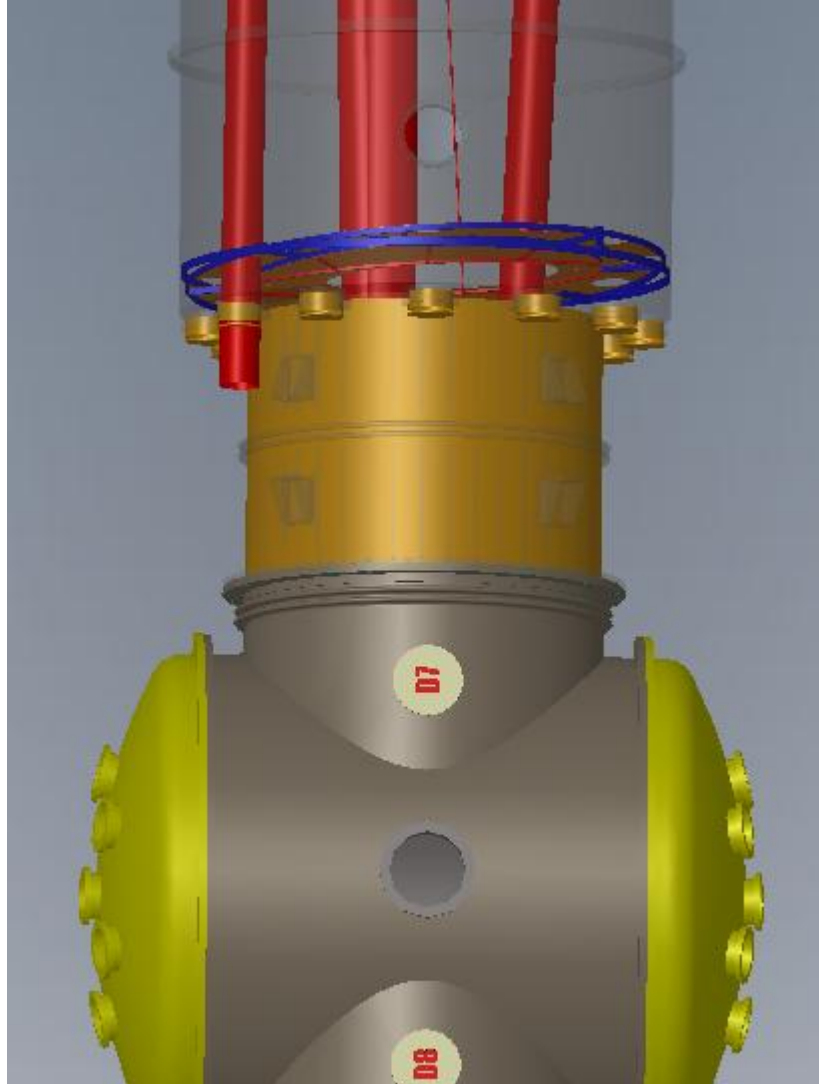


Figure 9: MCA2, H1-L1, HAM5

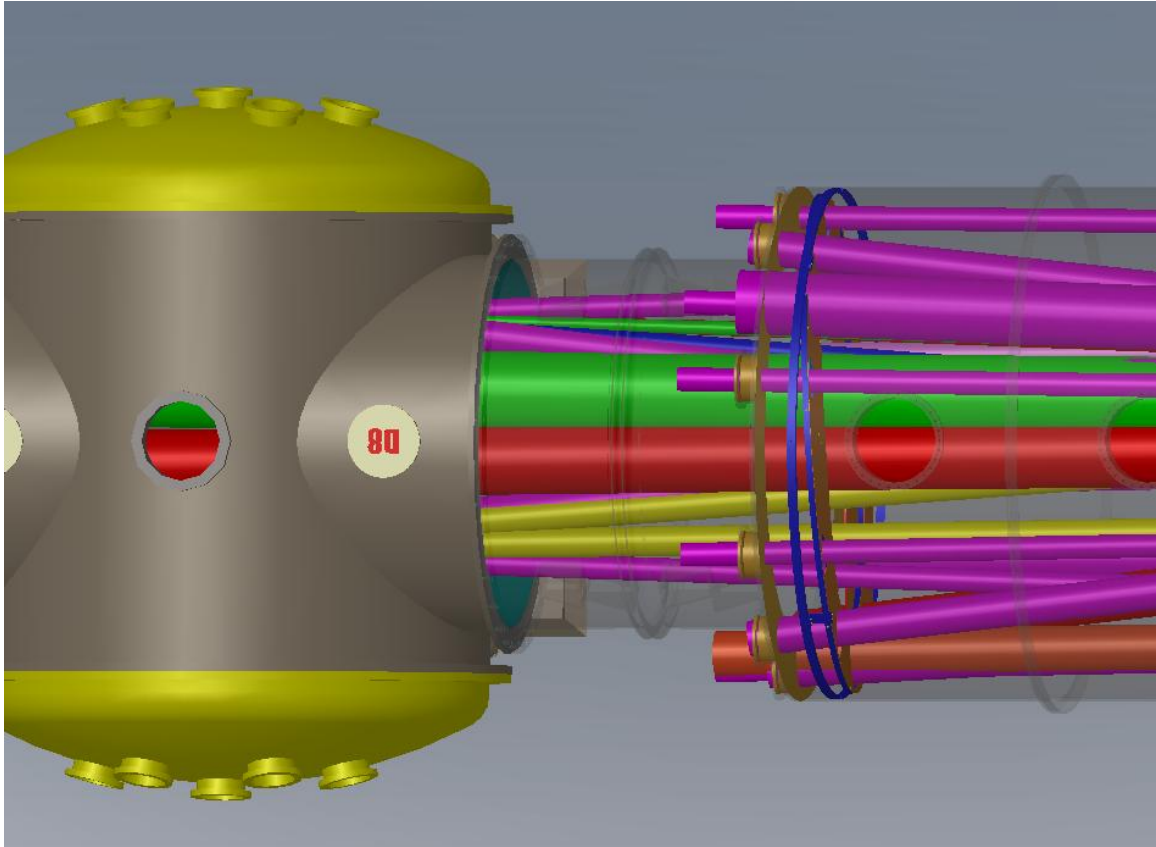


Figure 10: MCB3, H2, HAM9

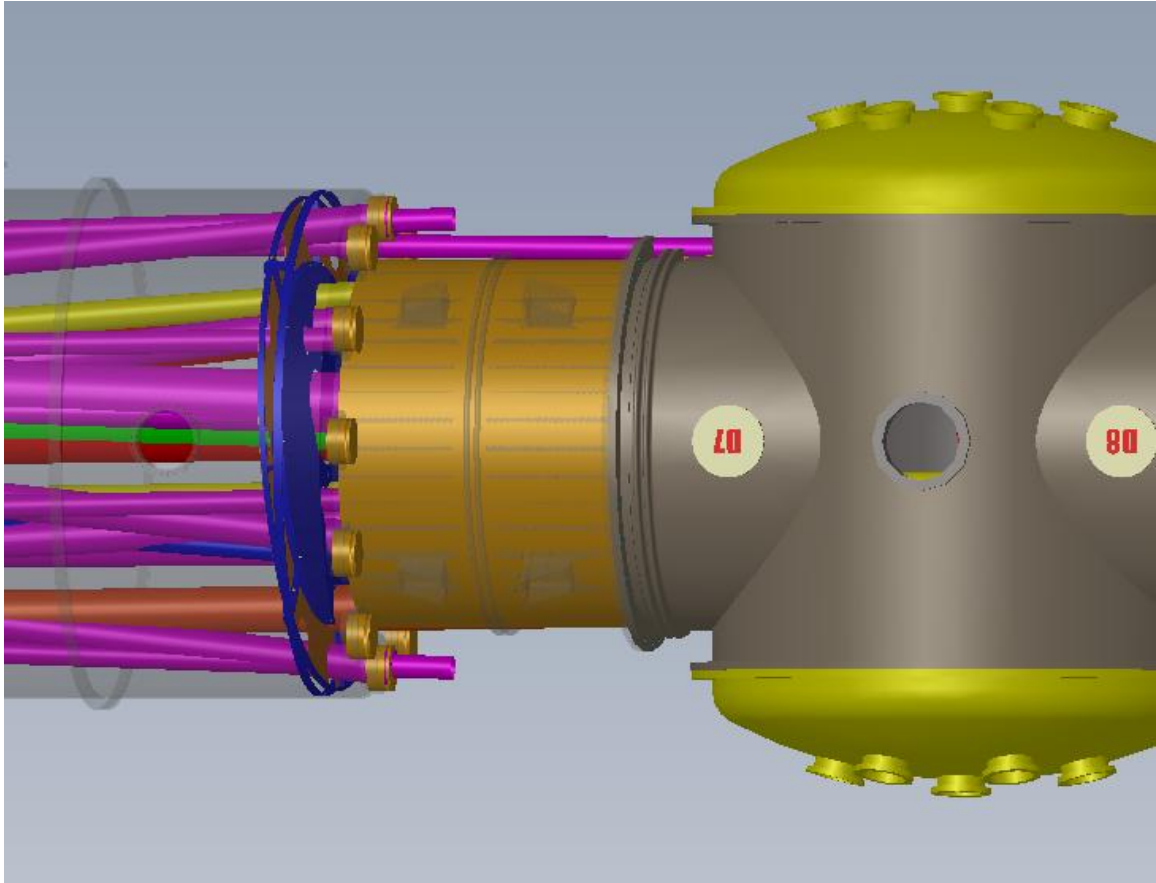


Figure 11: MCA3, H2, HAM8

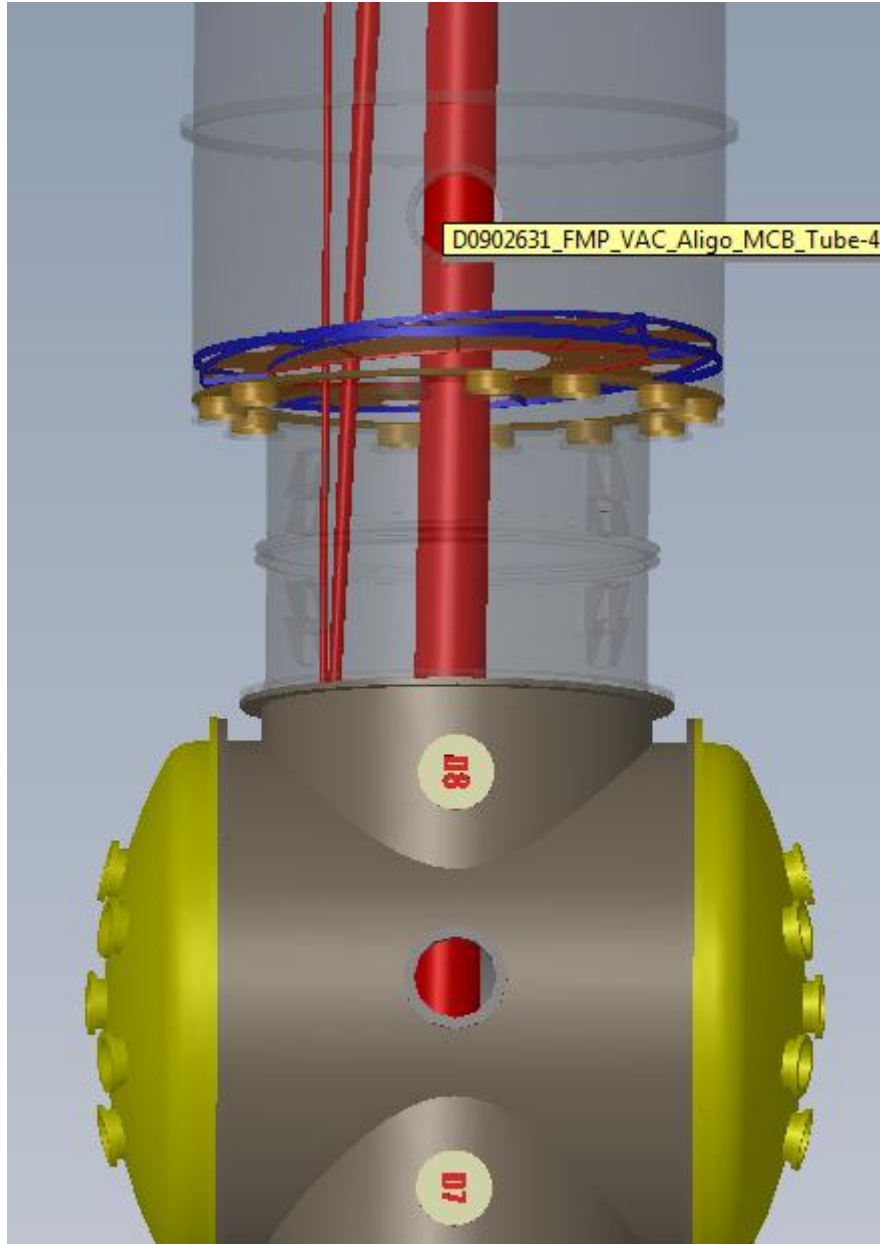


Figure 12: MCB4, H2, HAM10

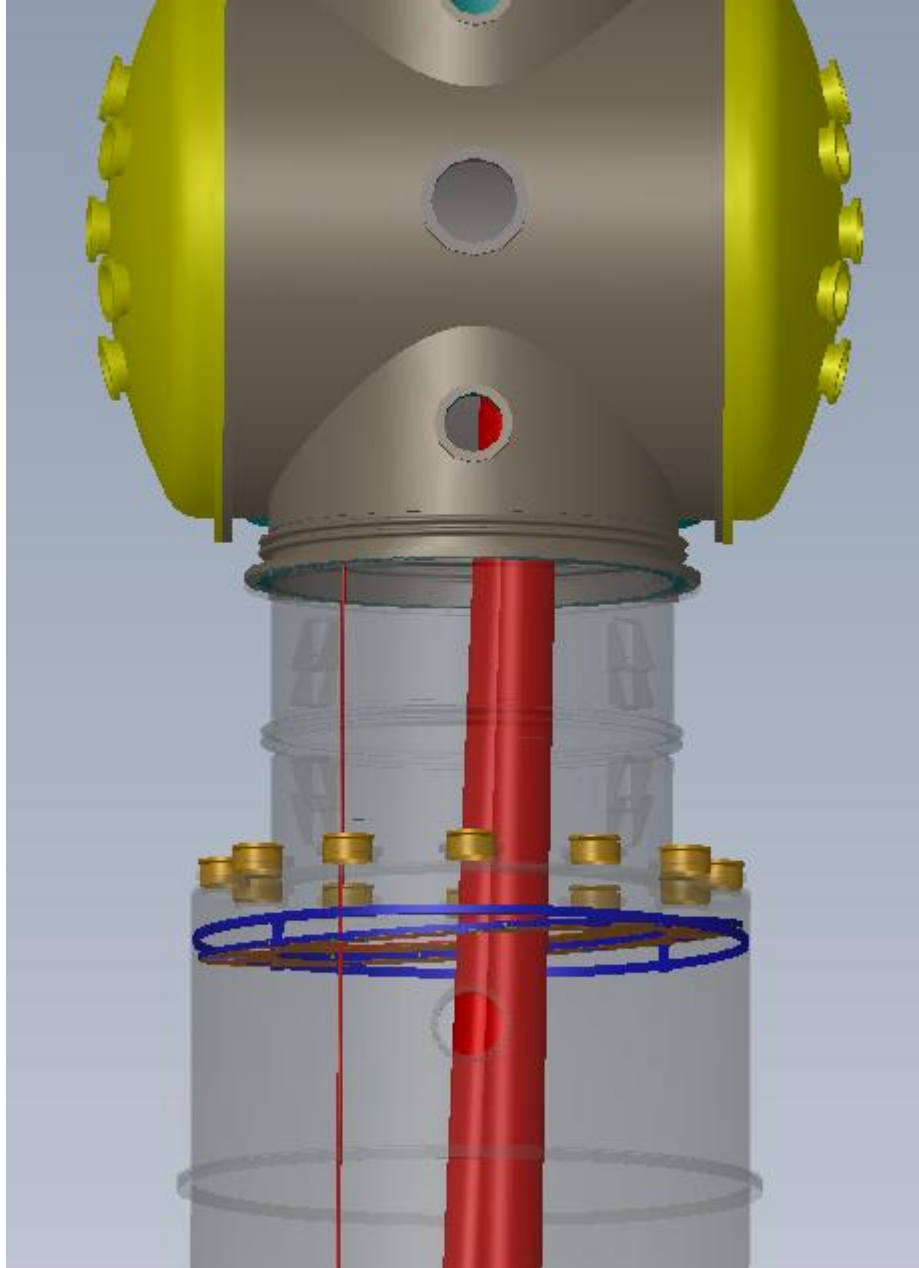


Figure 13: MCA4, H2, HAM11

3.2 Optical Interfaces

3.2.1 Main IFO Beams

The power recycling cavity beams and the signal recycling cavity beams pass through clearance holes in the mode cleaner baffle plates; see [T1100165](#). The clearance holes in MCA1, H1 and L1, and in MCA3, H2, are close to the power recycling cavity beams; however, they are designed to be larger than the 1ppm radius of the PR3 and PRM main IFO beams. The beam size requirements were taken from [T0900043-v10](#).

All the other baffle plates have a single large opening that provides adequate clearance, < 1ppm, for the IFO recycling beams.

The locations of the various beam holes in the baffle plates were determined by projecting 3D model beams using the following CAD files from the IO layouts and from ZEMAX layouts:

D0901920 H1 Zemax layout
 D0902345 H2 Zemax Layout
 D0902216 L1 Zemax layout

IO Layouts:

D0901974_ALIGO IO LHO FOLDED LAYOUT MAIN BEAM
 D1100925 ALIGO IO H2 MC1, CAMERA VIEW
 D1100926 ALIGO IO H2 MC2, CAMERA VIEW
 D1100927 ALIGO IO H2 MC3, CAMERA VIEW
 D1100928 ALIGO IO H2 PRM, CAMERA VIEW
 D1100929 ALIGO IO H2 PR2, CAMERA VIEW
 D1100930 ALIGO IO H2 PR3, CAMERA VIEW
 D0900919 ALIGO IO LAYOUT LLO BCS (Temp) is top assembly of:
 D1002917 ALIGO IO L1 LAYOUT PR3, OPTICAL LEVER BEAM
 D1002918 ALIGO IO L1 LAYOUT HAM2, OPTICAL LEVER BEAM
 D1002919 ALIGO IO L1 LAYOUT HAM3, OPTICAL LEVER BEAM
 D1002920 ALIGO IO L1 LAYOUT MC2, CAMERA VIEW
 D1002921 ALIGO IO L1 LAYOUT PR2, CAMERA VIEW
 D1002922 ALIGO IO L1 LAYOUT PRM, CAMERA VIEW
 D1002923 ALIGO IO L1 LAYOUT PR3, CAMERA VIEW
 D1002924 ALIGO IO L1 LAYOUT MC1, CAMERA VIEW
 D1002925 ALIGO IO L1 LAYOUT MC3, CAMERA VIEW

3.2.2 *Optical Lever Beams*

The H2 and H1 optical laser beams pass through the openings in the mode cleaner baffle plates that match the clear aperture of the viewports.

3.2.3 *Video Camera Beams*

Video camera beams pass through openings in the mode cleaner baffle plates that match the clear aperture of the viewports.