Cryostat 2
Front Drain Mercury Vessel Concept

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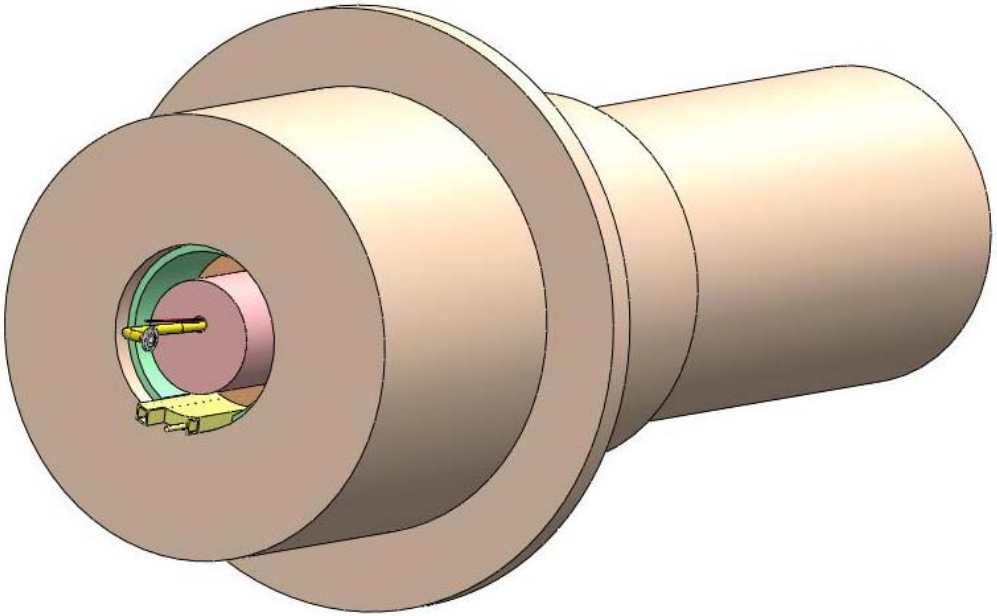
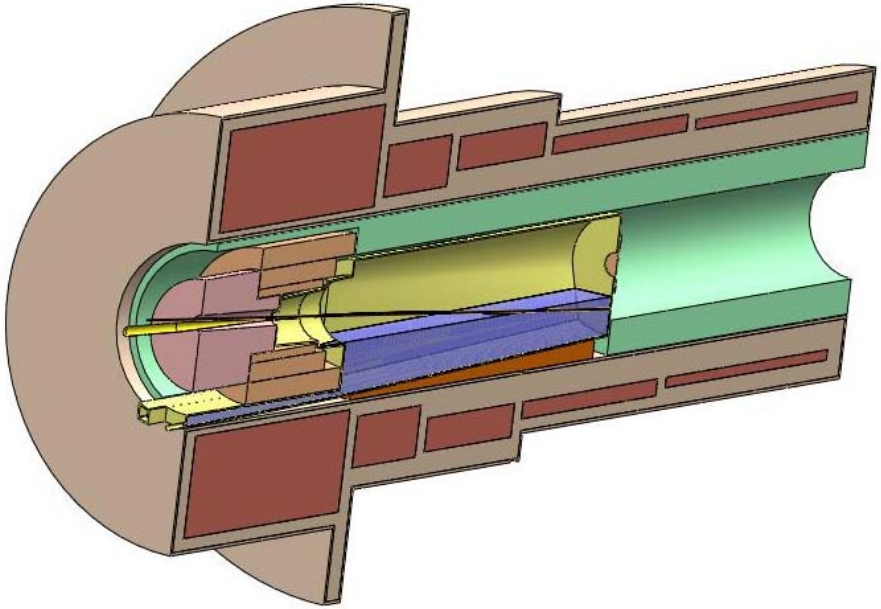
Front Drain Views

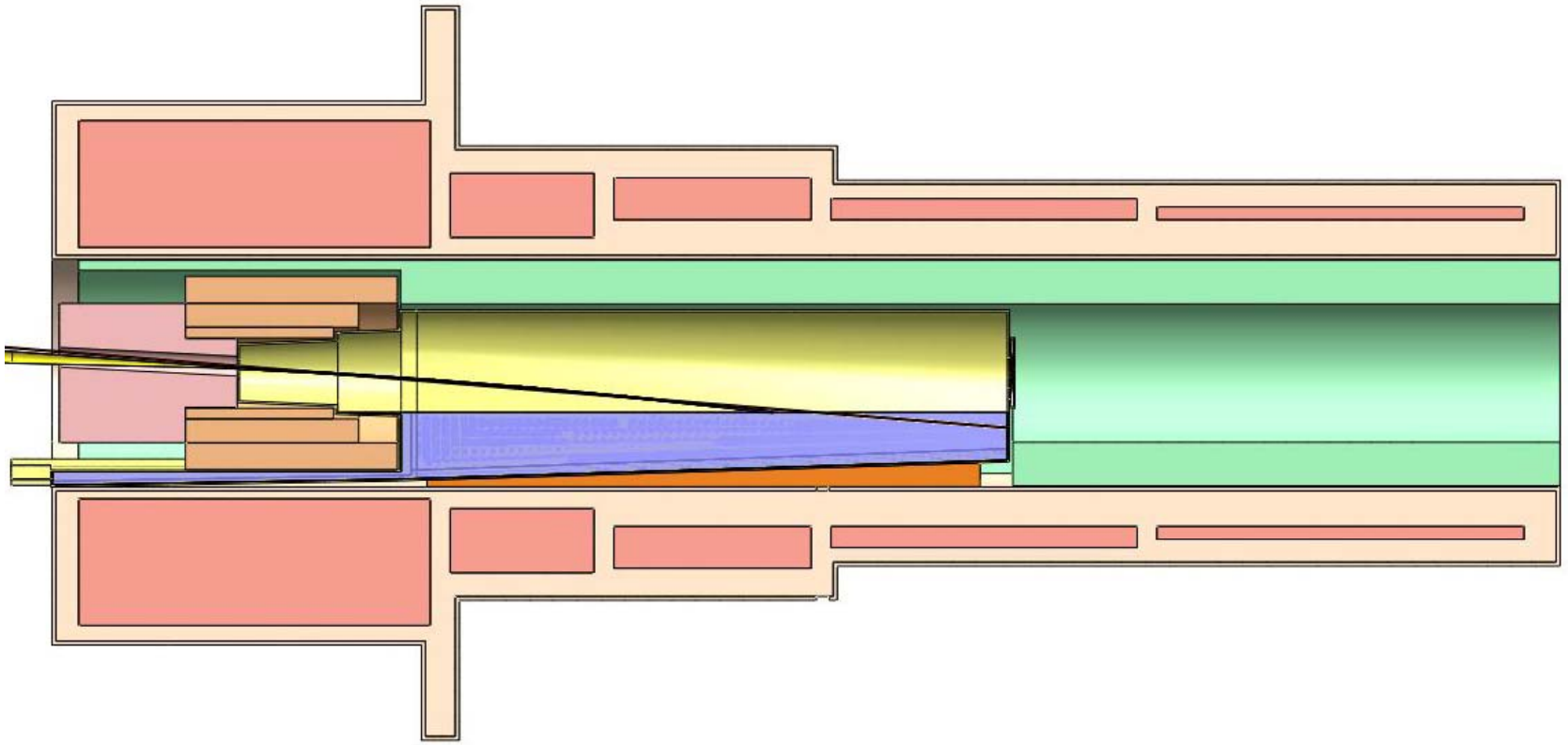
- Investigated possibility of having the Hg drain from the nozzle end of the cryostat
- Based on Study 2 cryostat layout





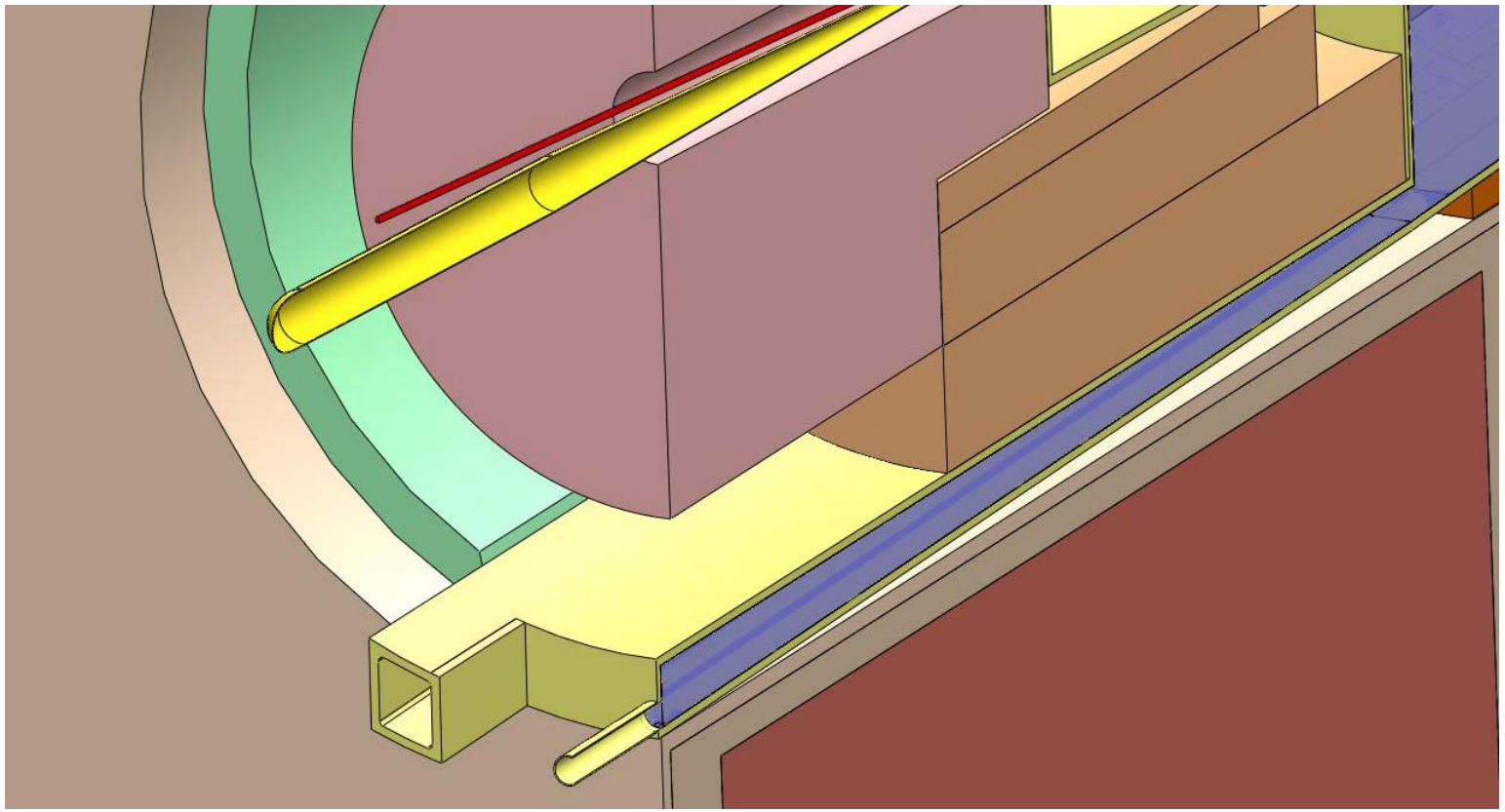
Cross Section View

- Mercury Chamber extends forward under resistive magnets
- Allows the mercury exiting the vessel to flow out the front of the cryostat



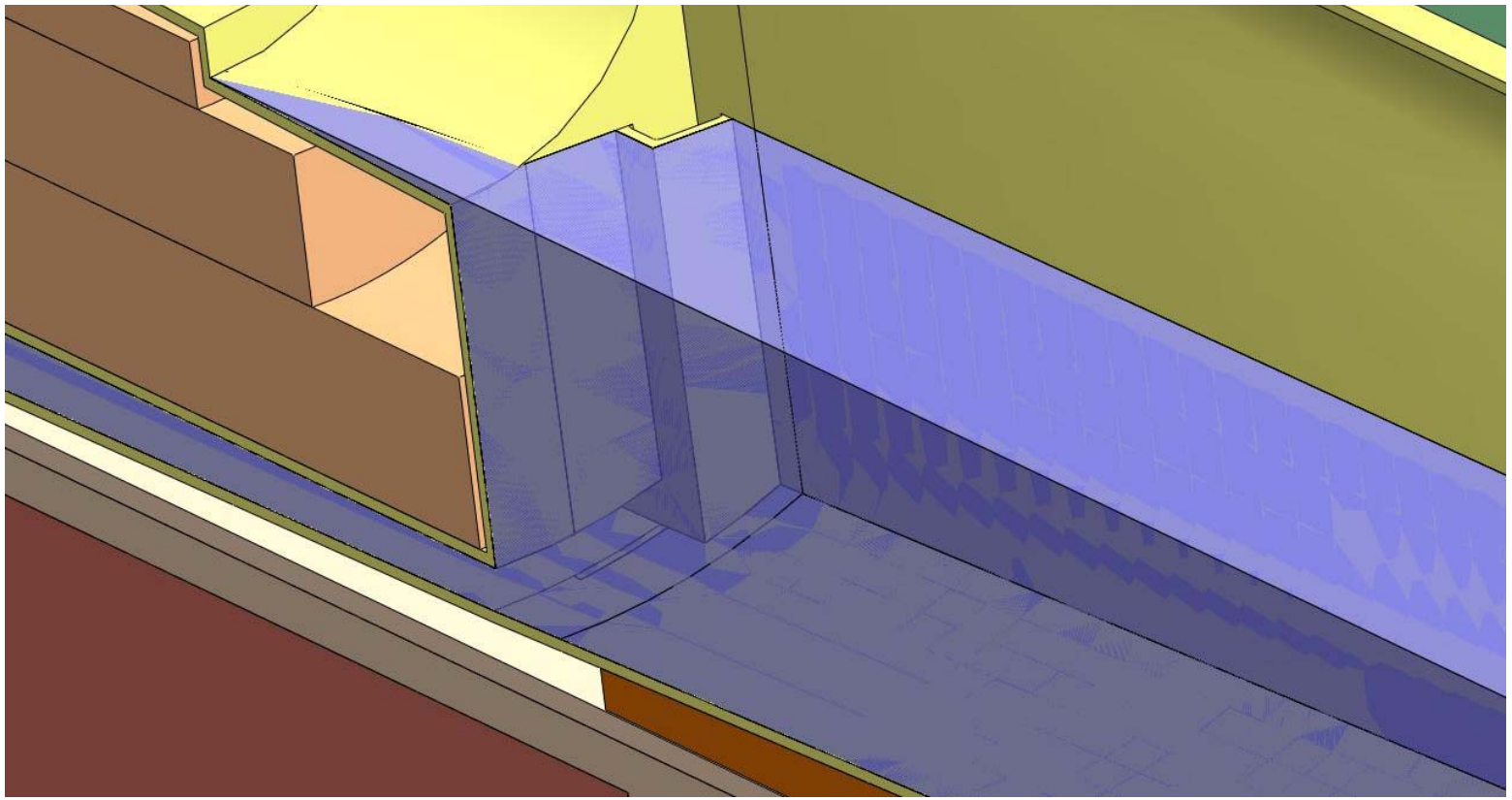
Nozzle End View

- Extended portion of chamber fills with mercury providing shielding to the SC magnets below
- Connects to gravity drain (round tube, center) and contains two channels for mercury overflow (square tube, one shown)



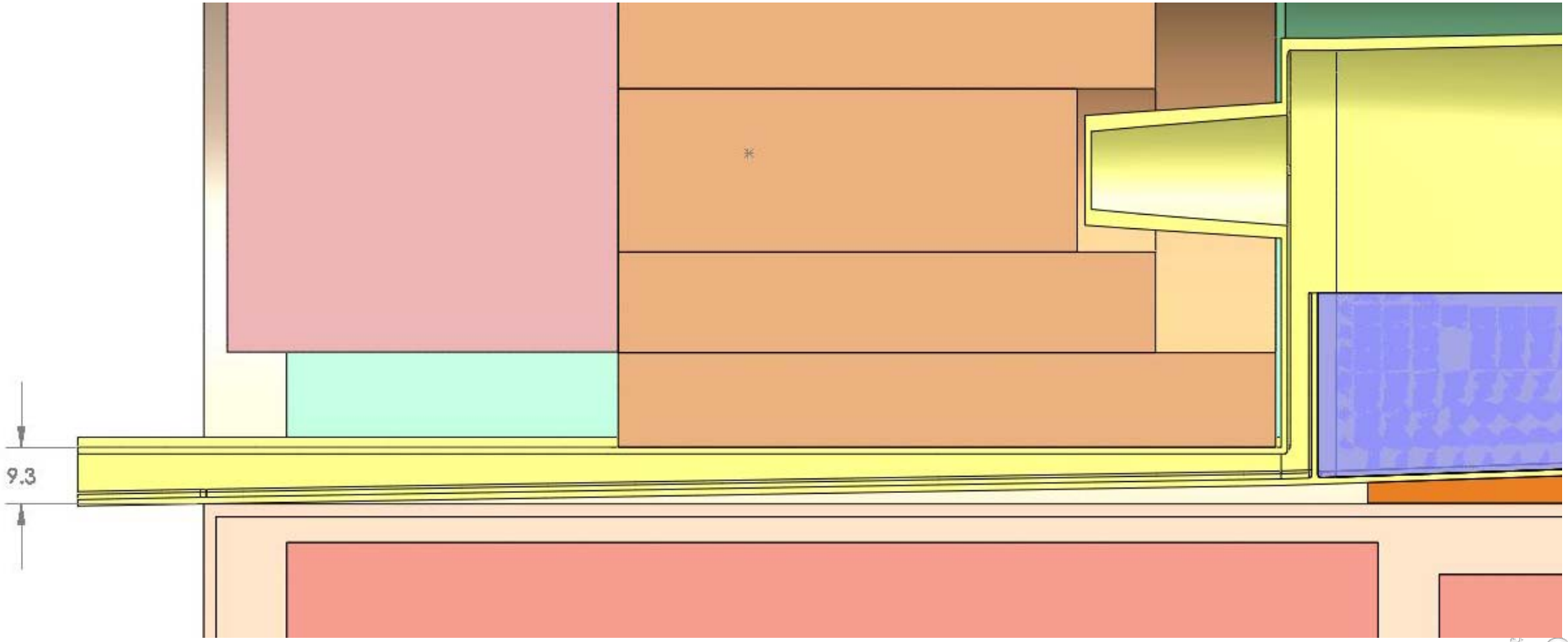
Overflow Drainage

- Vertical portion of overflow channel determines the depth of mercury
- Vessel floor sloped at 1°– 2° for the mercury to flow out the gravity drain or overflow channels



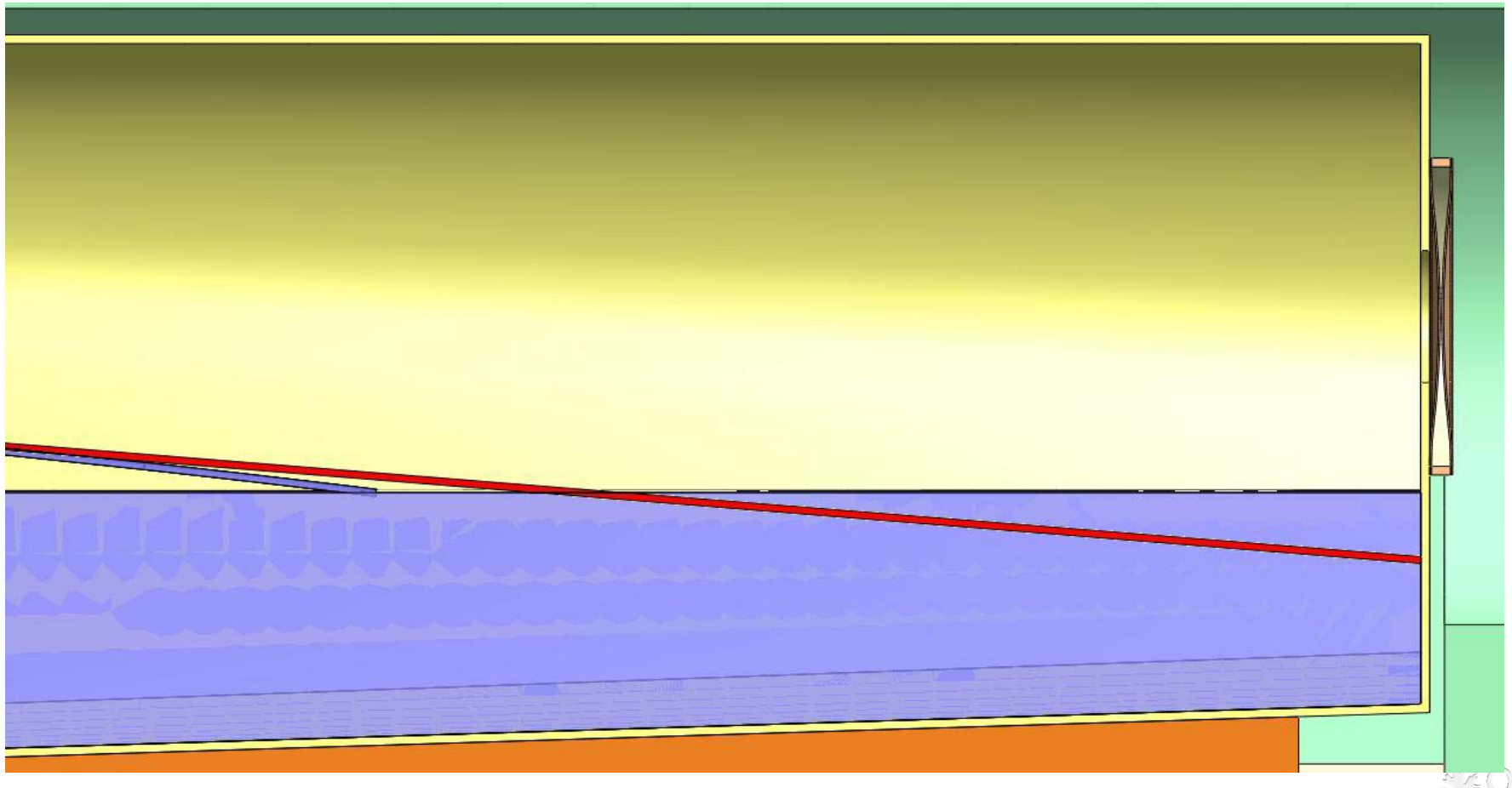
Overflow Channel Section View

- Space between resistive and SC magnets should be maximized for this drainage approach
- Space in current design: 9.3 cm
- Resistive magnet jacket not shown

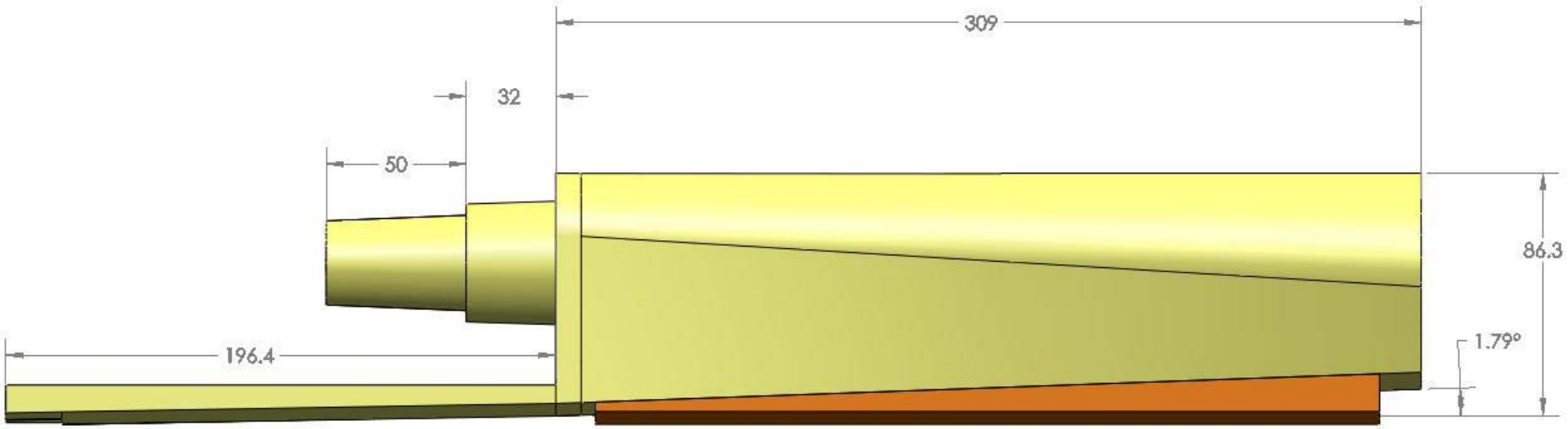


Beam/Jet Dump Region

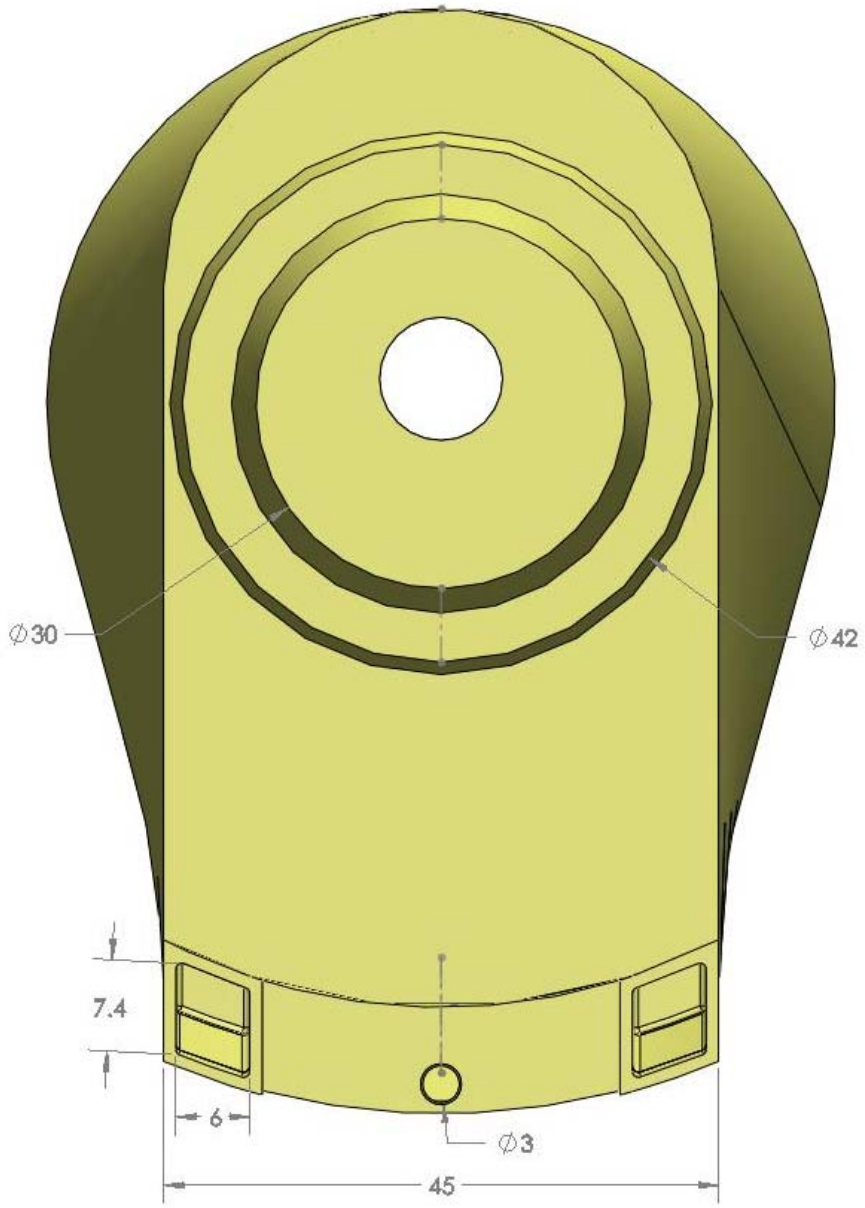
- Mercury jet (blue line) and proton beam (red line)
- Vessel length to be determined
- Pool depth increased over earlier concept



Approximate Chamber Dimensions (cm)

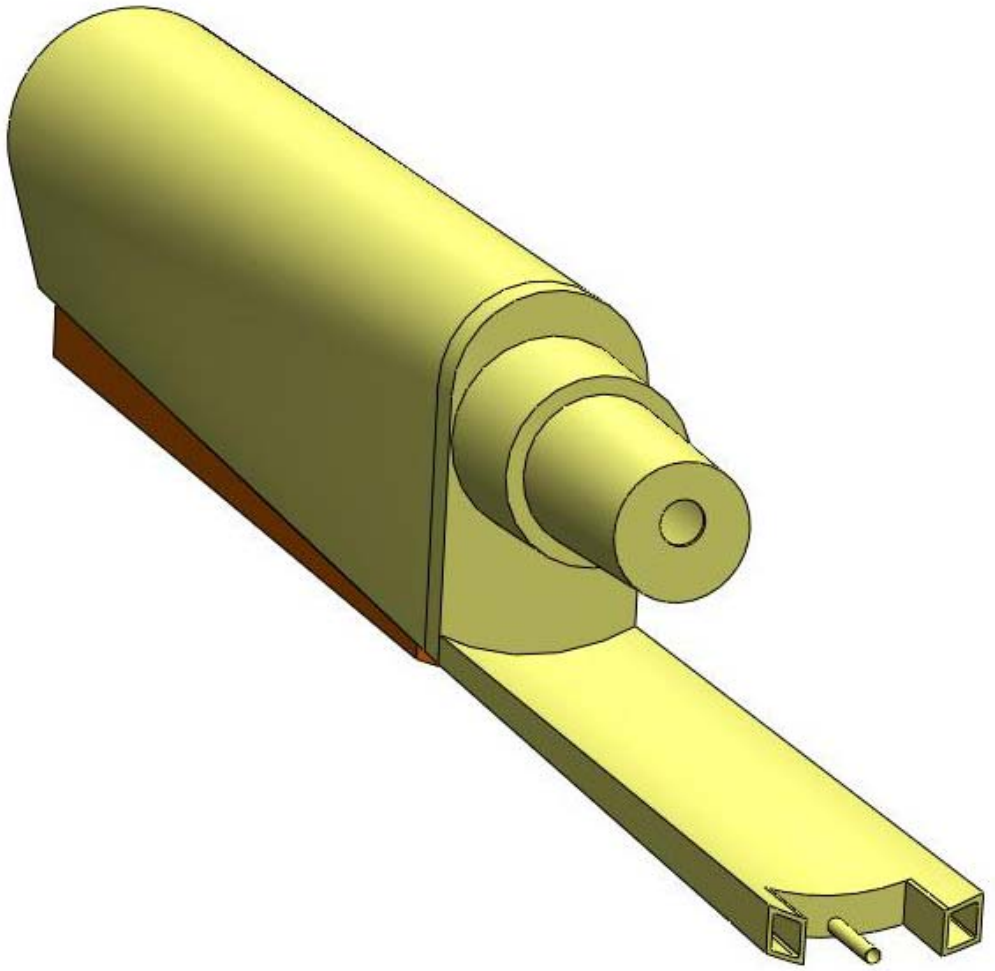


Chamber Front View with Dimensions (cm)



Chamber Isometric View

- Fabrication issues will need to be considered
- Slope feature can be internal or external (shown)



Observations

- Mercury pool is deeper than in downstream drain concept
  - Should positively affect surface fluctuations (waves)
- Mechanically avoids trapping cryostat by Hg vessel
- RH handling of vessel should be easier
- Space between resistive and SC magnets needs to be maximized in future design concepts
- Downstream beam window will not be as accessible if vessel ends in middle of cryostat