

# Update on Be Wall Cavity

**MAP Meeting**

June 4, 2010

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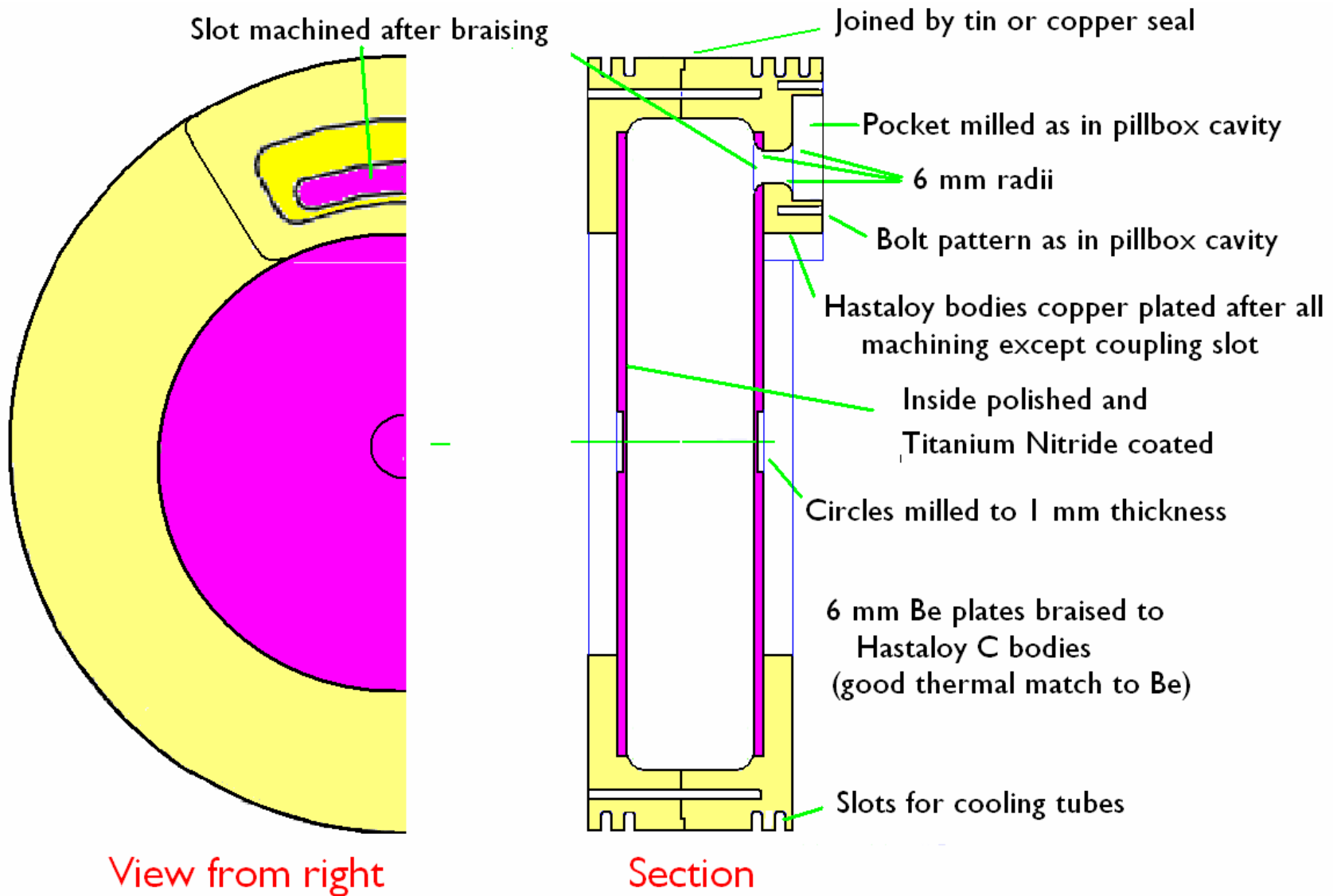
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# Current Status

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- An LBNL account ID is now open for the design/fab project
- Preliminary discussions (R. Palmer, S. Virostek, D. Li) and design work has resulted in several design concepts
- A preliminary 3D CAD model of one of the design concepts has been completed
- One of the next steps is a cost analysis of the concepts
  - Cost of raw beryllium material
  - Cost of various fabrication techniques
- Also need to analyze the manufacturing risks
  - Brazing
  - Coupling port
  - Bolted joints
  - Machining processes

# Original Concept (R. Palmer)



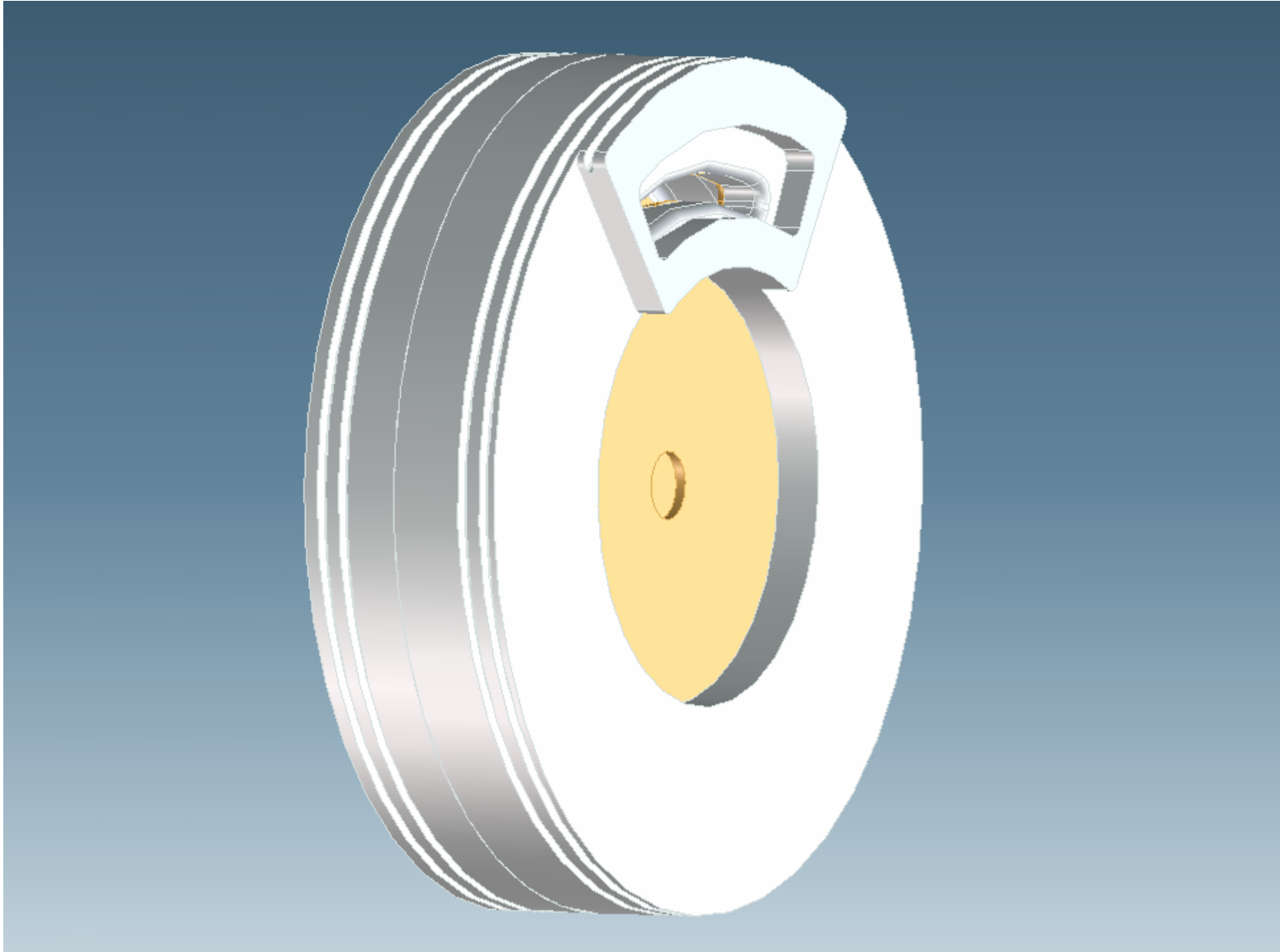
# Concept Descriptions

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- **Common characteristics**
  - Two bolted halves w/RF and vacuum seal
  - Main body is Cu plated Hastelloy or solid Cu
  - Cavity inner side walls are beryllium (TiN coated)
  - Slotted coupling port in side wall
- **Beryllium side wall options**
  - 1) Thin Be foil (~500  $\mu\text{m}$ ) brazed to side walls
  - 2) Thick Be plates (~6 mm) brazed to side walls
  - 3) Solid Be side walls (no brazing)
- **An all Be cavity is not likely to be practical**
- **Bolted cavity assembly offers accessibility advantages over an e-beam welded cavity**

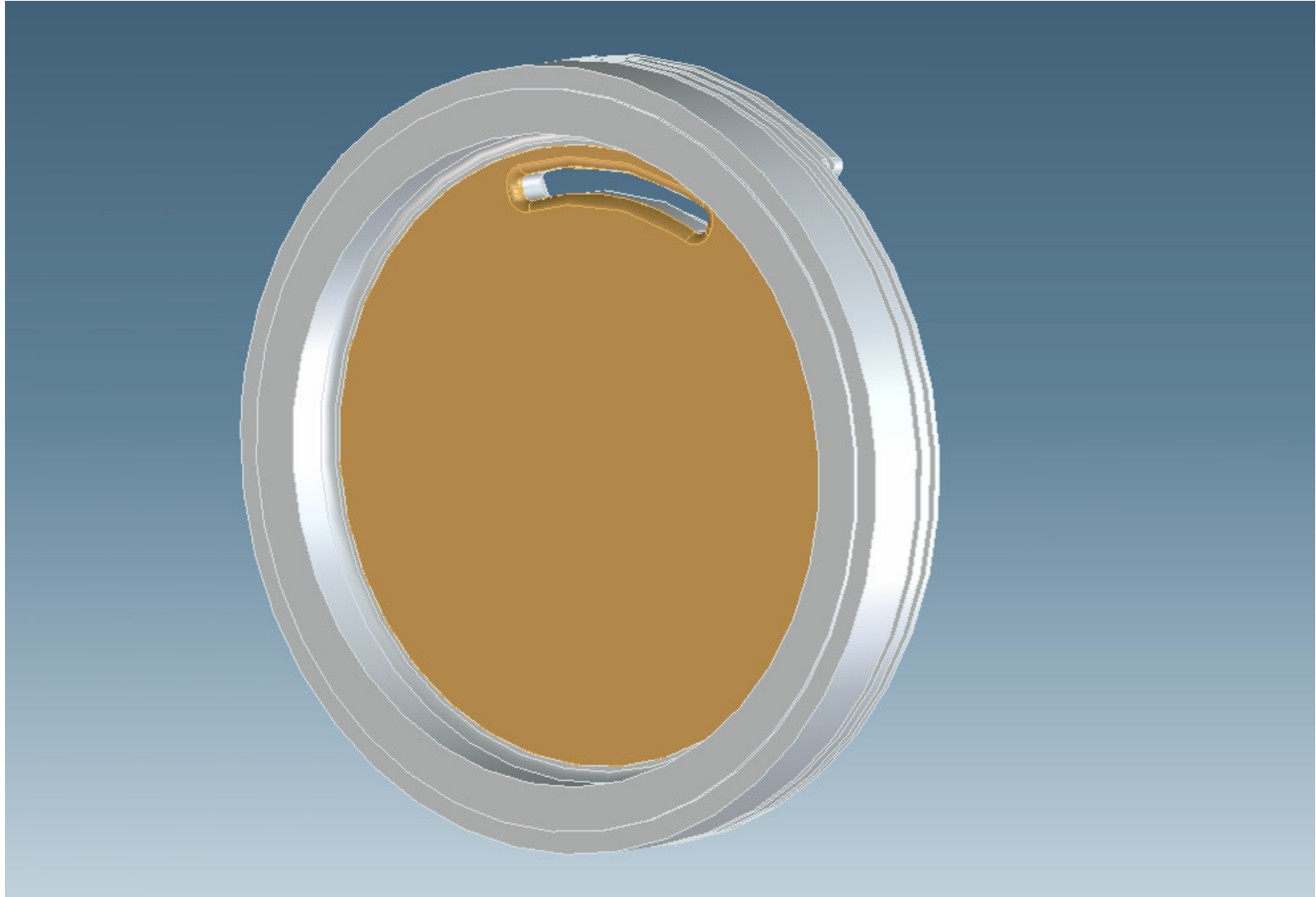
# 3D CAD Model

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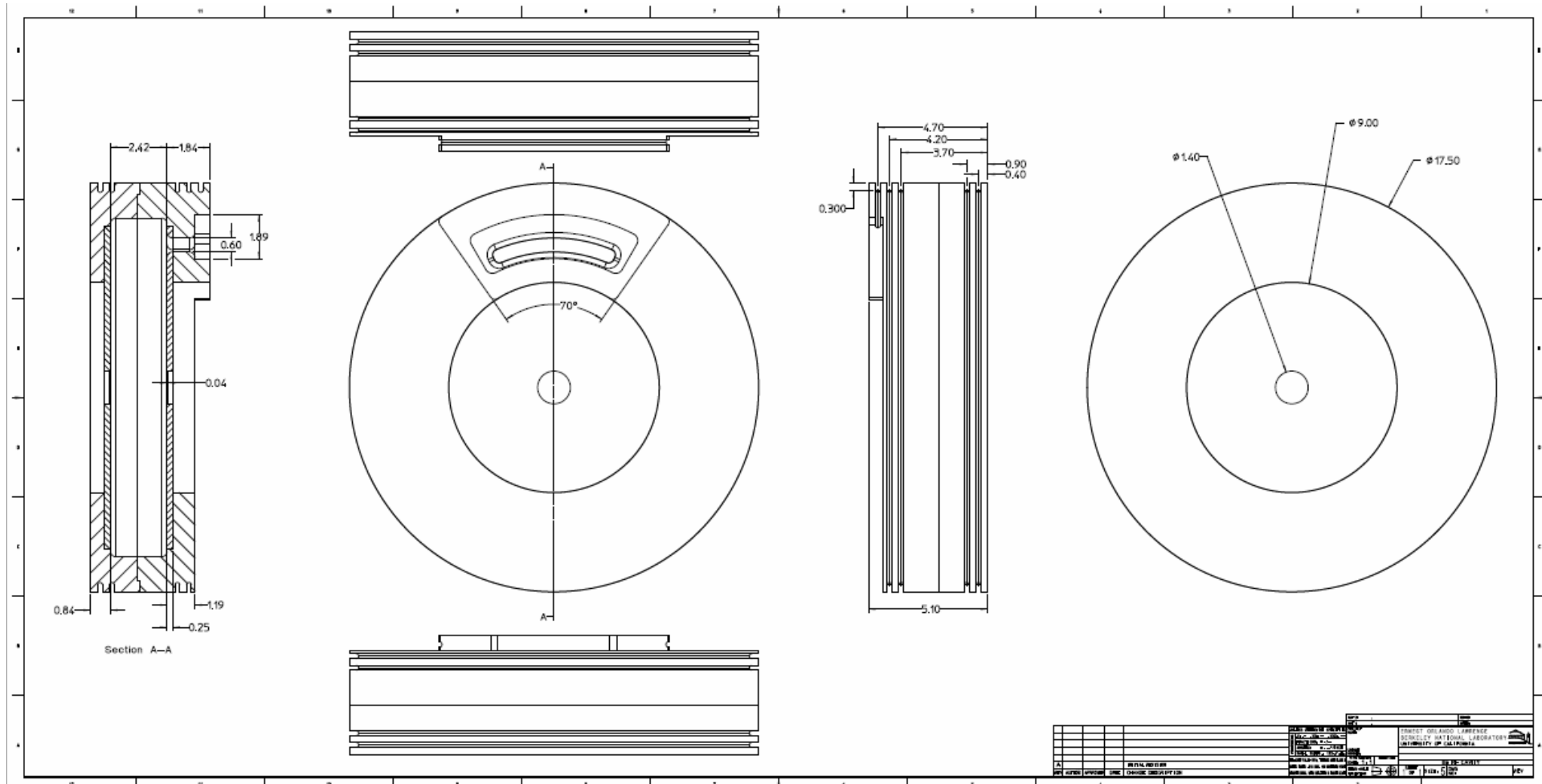


# 3D CAD Model

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# 2D Layout of Cavity Concept



# Manufacturing Risks

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- **Brazing**

- Be brazing is only done at select shops
- Differential expansion may be a problem for solid Cu body
- May be some issues with brazing to Cu plated Hastelloy
- Transition from Be side walls to rounded corner at cavity OD presents some challenges

- **Coupling port**

- Interface between Be and cavity body material at port needs to be fully brazed
- Need to incorporate a connection flange to RF waveguide

- **Cavity joints**

- Seal(s) between cavity halves needs to provide a good RF connection as well as a vacuum seal

- **Machining: few shops available to do Be machining**



# Schedule

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## Task Description

## Date Range

- Complete conceptual design layouts 5/10 - 7/10
- Perform analysis and trade studies 6/10 - 8/10
- Develop final conceptual design 8/10 - 9/10
- Generate fabrication drawings 10/10 - 12/10
- Procure long lead materials (Be) 11/10 - 2/11
- Fabricate cavity components 3/11 - 6/11
- Braze, coat Be and assemble cavity 7/11 - 9/11