Introduction

- Two dampers to be delivered to BNL for the 225° and 270° (named BNLO1 and BNLO3 respectively) positions on the RHIC cavity
- A series of design changes occurred since the prototype's fabrication, with the aim of removing the presence of InCuSil braze material, due to overheating.
- JLab tasks included developing an assembly sequence, fabricating parts, welding, chemistry, tuning and testing.
- Dampers are scheduled to be completed and delivered to BNL by late September 2015

Filter Assembly

- Sapphire rings are held inside Nb rings using 1mm thick Nb "stoppers, electron-beam welded (EBW) onto Nb rings (see main photo insert)
- Special clamps were fabricated out of reactor grade Nb (photo below). In addition to holding the stoppers in place, they served as heat sinks so as to not crack the sapphire, which is susceptible to point heat loads
- After EBW, the sharp edges of the stoppers were rounded using a silicon carbide abrasive. This was followed by swab BCP

Further Work

1. End Cap to be EBW to seal the Tuna Can
2. Titanium cooling tubes to be TIG welded to turret and NbTi Flange
3. Tubing to be pressure tested to 37 psig, and damper chamber to be leak checked to 1 x 10⁻¹² Torr L/s of helium
4. Cavity side of damper (from end of Loop to NbTi Flange) to receive 15 micron BCP

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References


Abstract

The Higher-Order Mode (HOM) Dampers for the Relativistic Heavy-Ion Collider’s (RHIC) 56 MHz cavity at Brookhaven National Laboratory (BNL) are currently being fabricated at JLab. The coaxial damper is primarily constructed with high RRR niobium, with a combination of niobium and sapphire rings as the filter assembly. Several design changes have been made with respect to the performance of a prototype damper – also fabricated at JLab – which was found to quench at low power. The production dampers are being tuned and tested in the JLab vertical test area (VTA) prior to delivery. Two HOM dampers will be delivered to BNL, they are to be used in the RHIC in November, 2015. This paper outlines the challenges faced in the fabrication and tuning process.