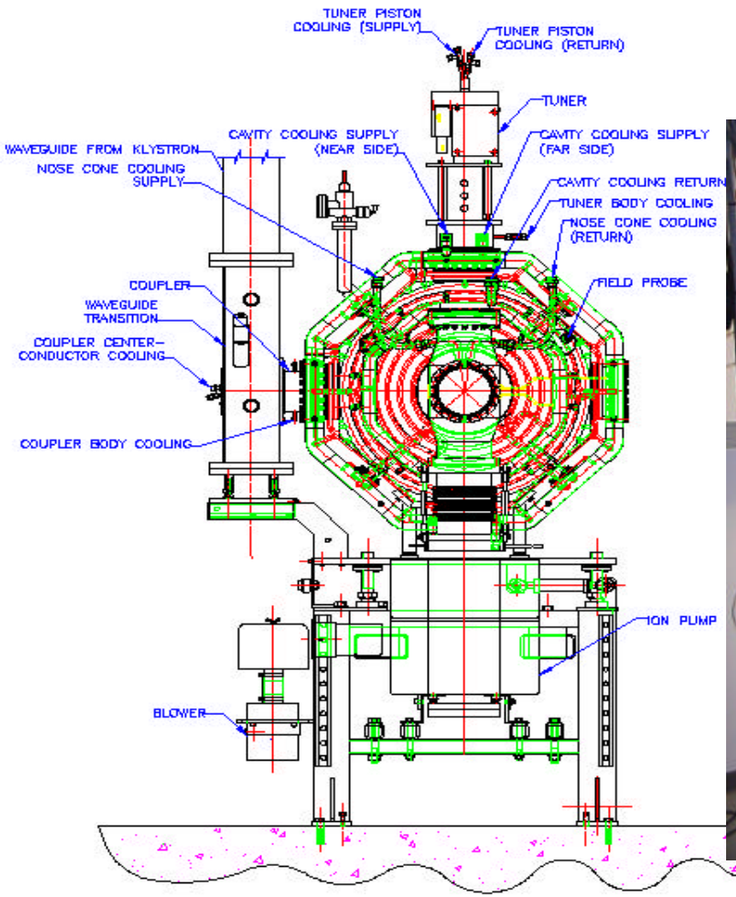
Leonard Morrison

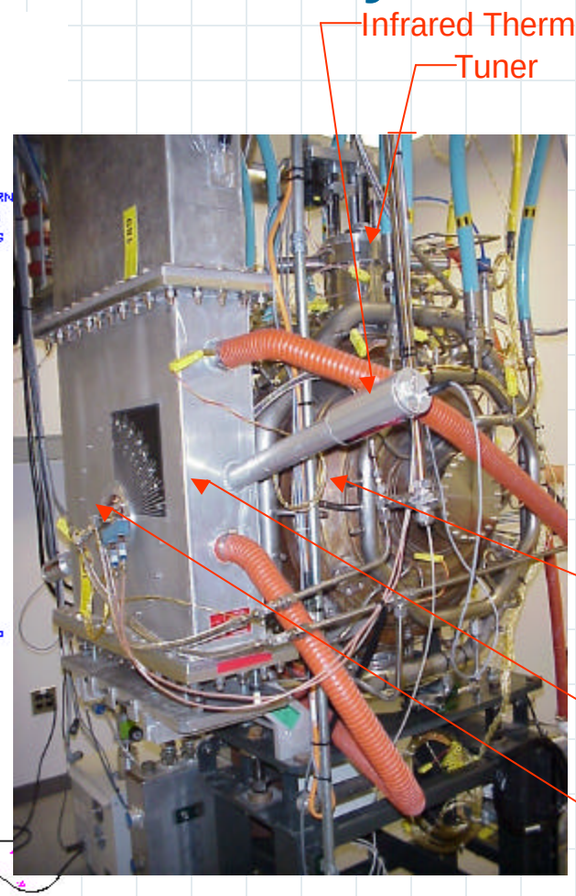
ASD/ME

Responsibilities:

1. Provide Mechanical Engineering support to the RF Group in the form of designing, fabricating and maintaining RF mechanical devices such as:
   - Tuners
   - Couplers
   - Field Probes
   - Dampers
   - Cooling System (Blowers)
   - Infrared Thermometers
2. Maintain up-to-date procedures for maintenance and upgrades.
3. Daily monitoring of these mechanical systems performances.
4. Complete storage ring injection area upgrade.

Storage Ring Single Cell Cavity



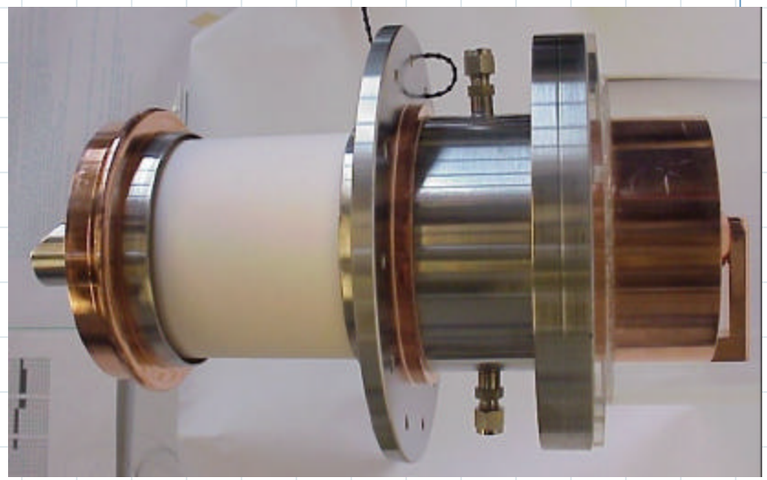


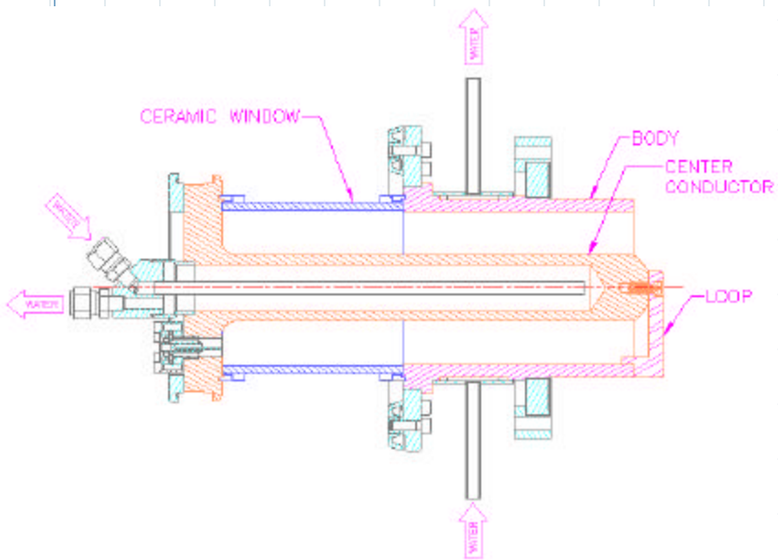
INSTALLED STORAGE RING CAVITY

Input Coupler

(Current Design)

- Ceramic Window
- Copper Deposits
- Thermal Cracks





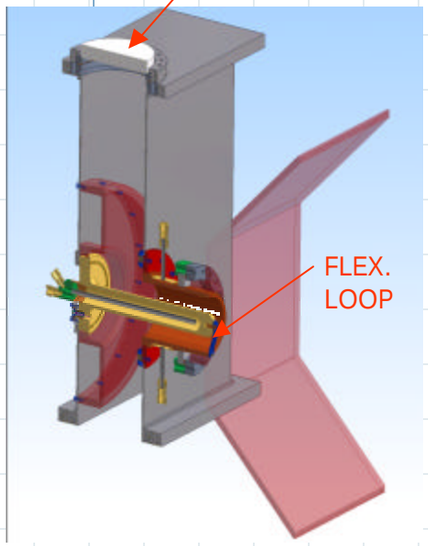
New Window

Failed Window

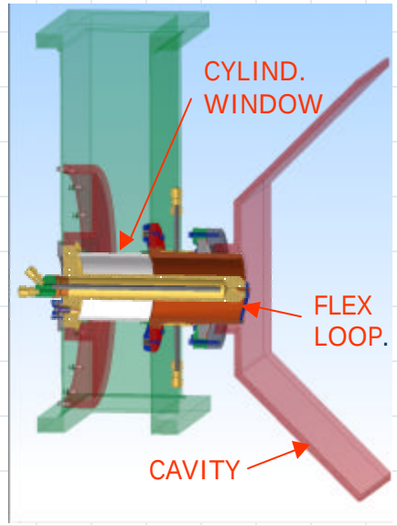
High Power Input Coupler

(Proposed Designs)

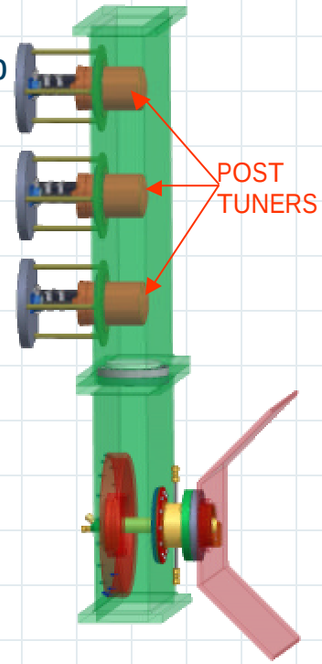
- TYPE “A” – Adjustable Coupling, Disc Window, Flex Loop
- TYPE “B” – Adjustable Coupling, Cyl. Window, Flex Loop
- TYPE “C” – Post Tuners, Disc Window, Fixed Loop
- TYPE “D” – Post Tuners, Rect. Window, Fixed Loop



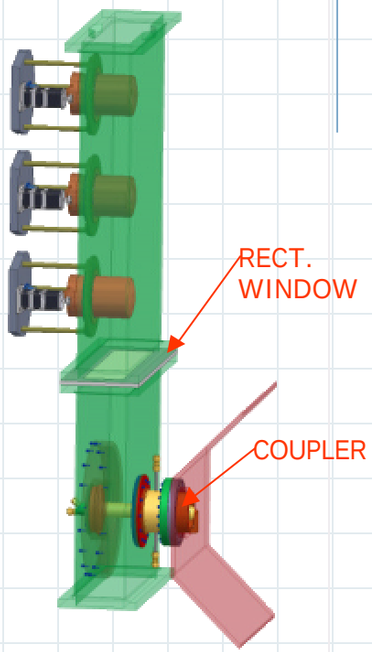
TYPE “A”



TYPE “B”



TYPE “C”



TYPE “D”

Leonard Morrison

04/02/2003

Mechanical Engineering Group

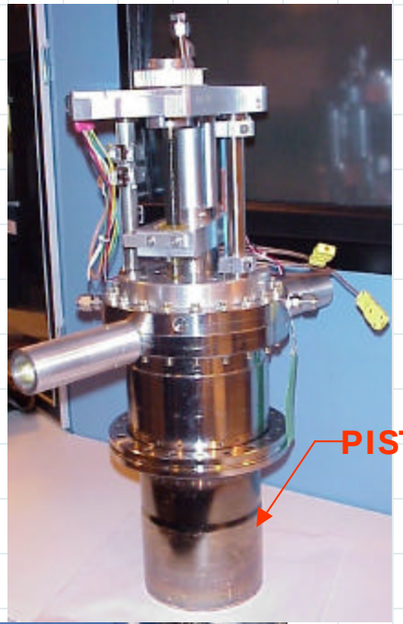
Accelerator Systems Division

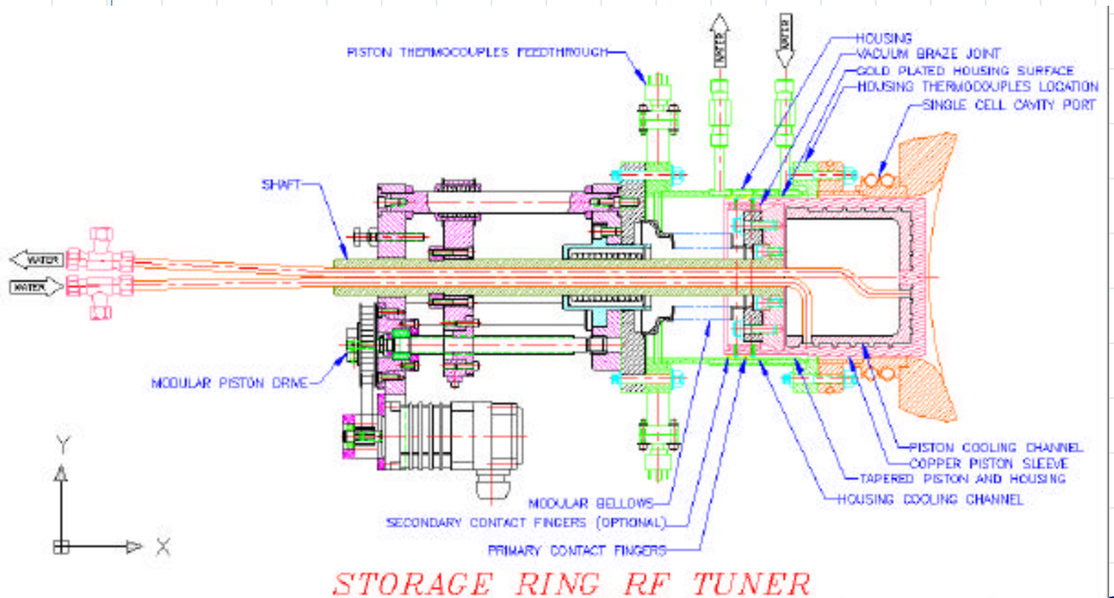
Advanced Photon Source

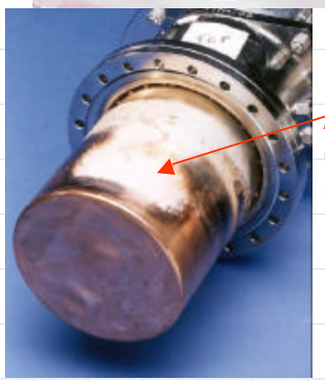
Argonne National Laboratory

Storage Ring Tuner

- Function
- Future Design Changes







STORAGE RING RF TUNER

Leonard Morrison

04/02/2003

Mechanical Engineering Group

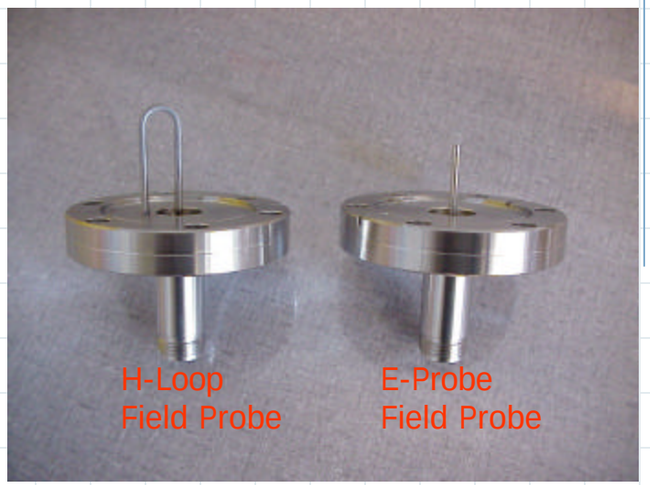
Accelerator Systems Division

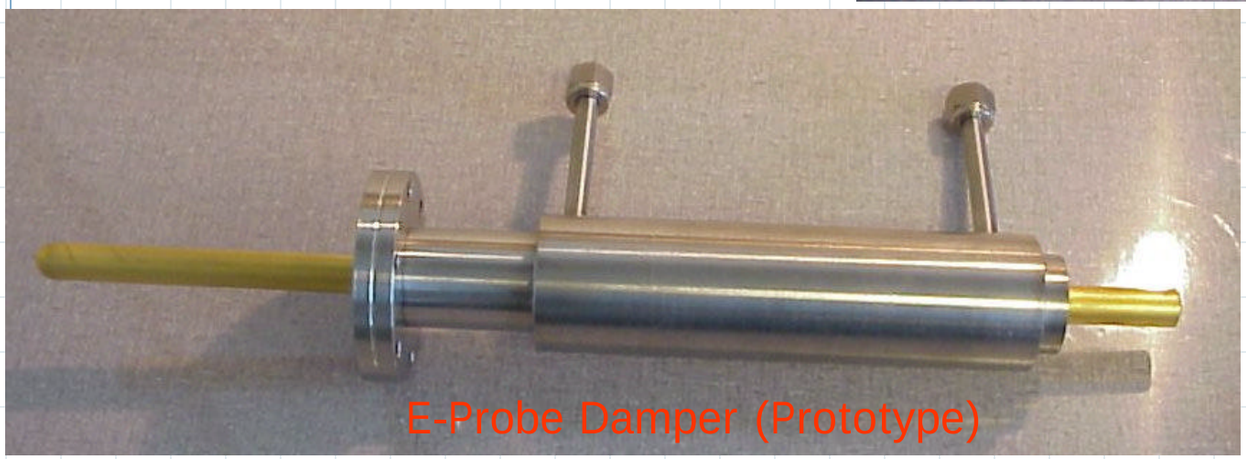
Advanced Photon Source

Argonne National Laboratory

Field Probes and Dampers

- RF Diagnostics
- Beam Stability





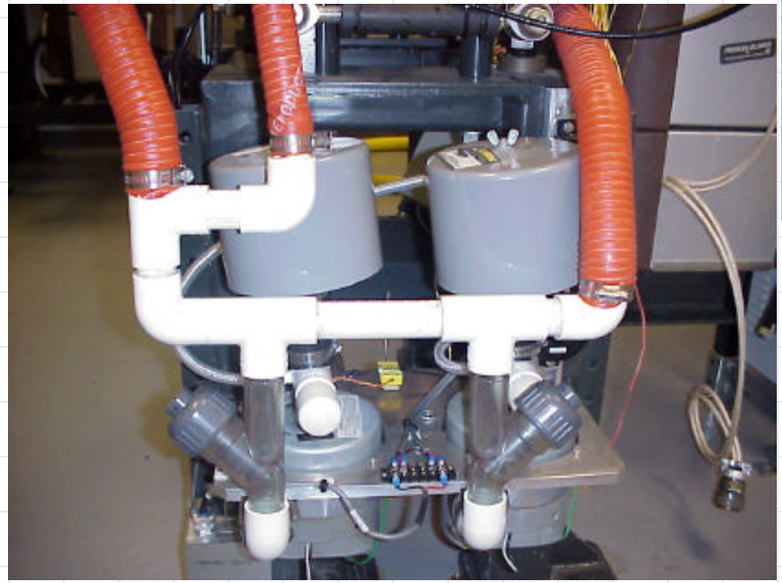
Support Devices

- Blowers

  Provide cooling for coupler ceramics and tuner bellows

- Infrared Thermometer

  Measures temperature on coupler ceramic window

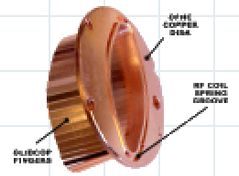


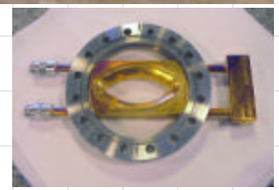
BLOWERS

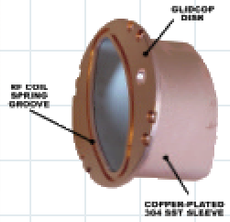
INFRARED THERMOMETER

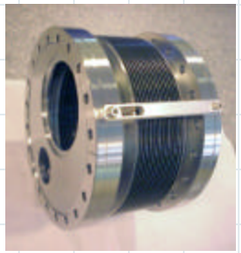
Storage Ring Injection Area Upgrade

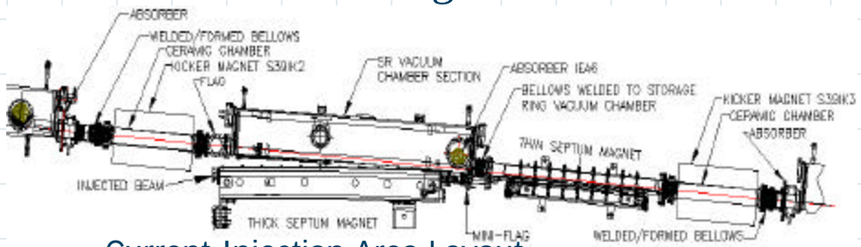
- Upgraded components:
  1. Bellows
  2. Bellows Liners
  3. Insertion Chamber
  4. Kicker Magnets
  5. Transition Absorbers
  6. Mini-Flag Chamber







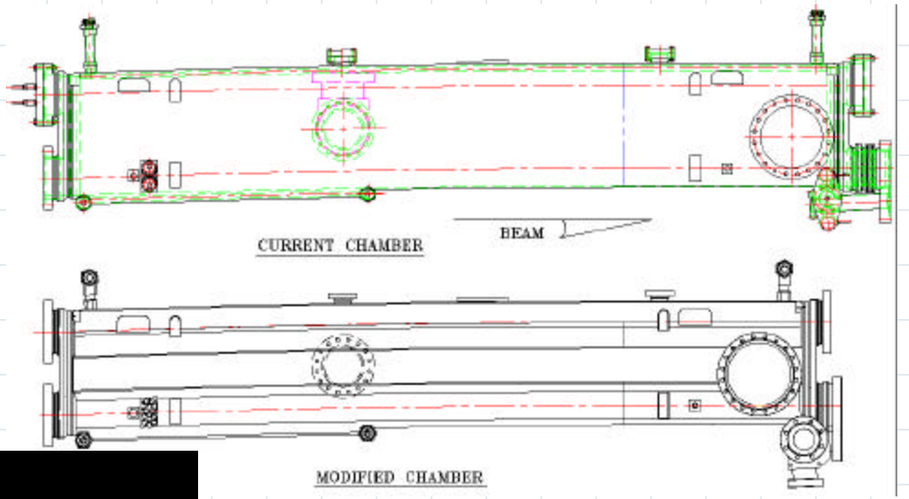


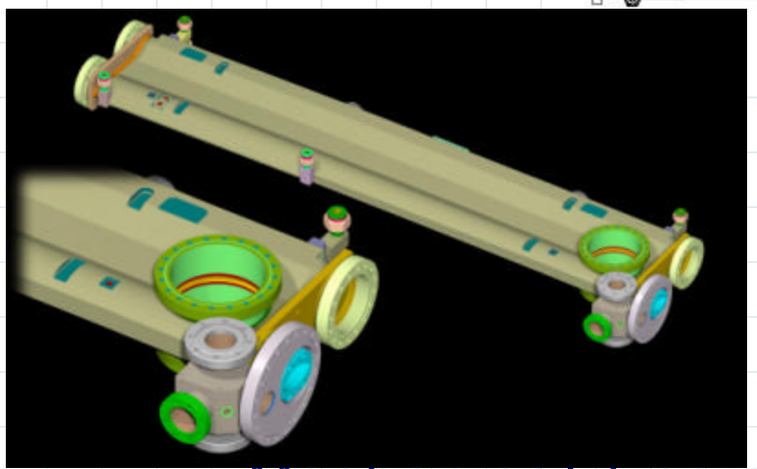


Current Injection Area Layout

Current & Modified S6i Vacuum Chamber

- Design Changes:
  1. Shorten Chamber
  2. Remove Bellows

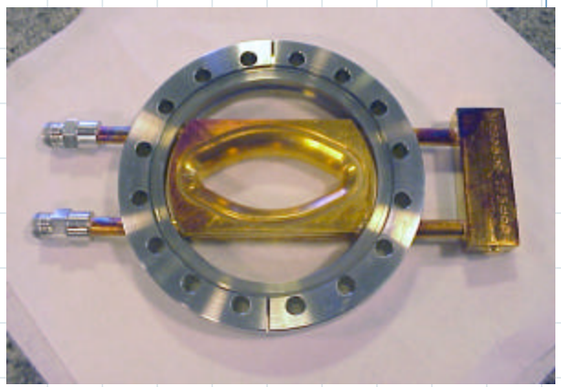


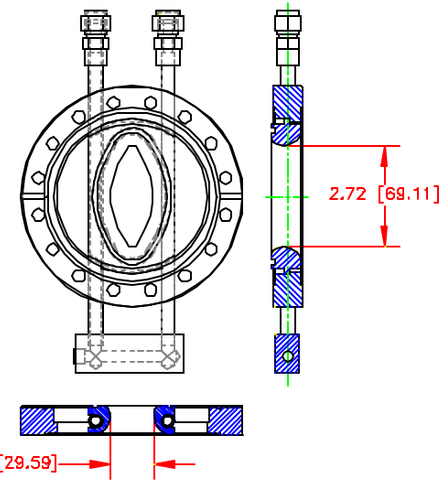


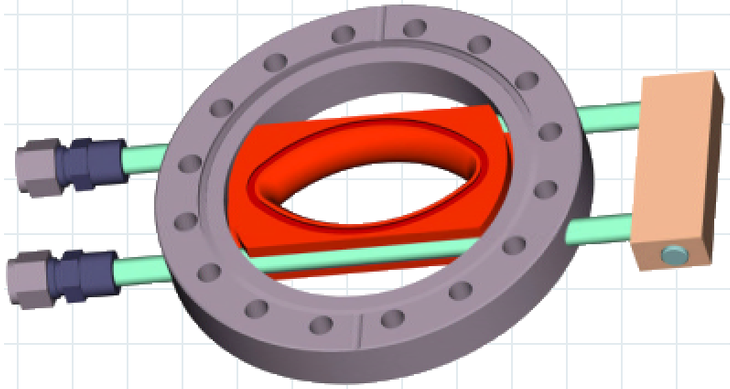
Transition Absorber

- Design Changes:

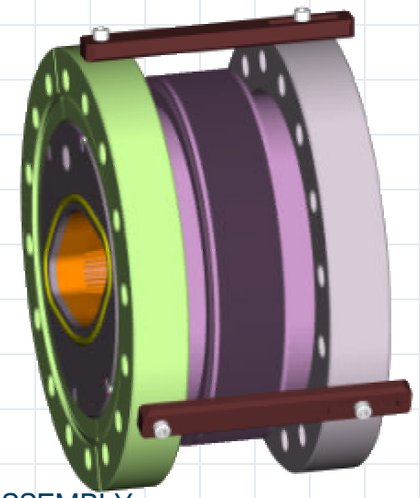
1. Aperture Reduction
2. Absorbing Material



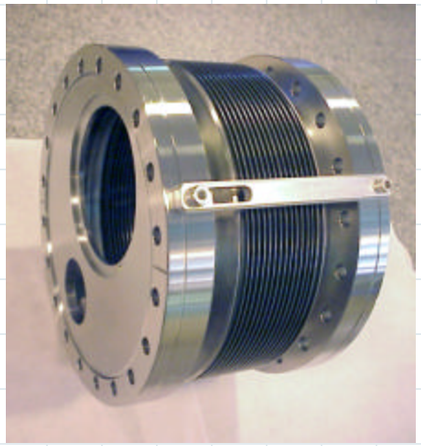


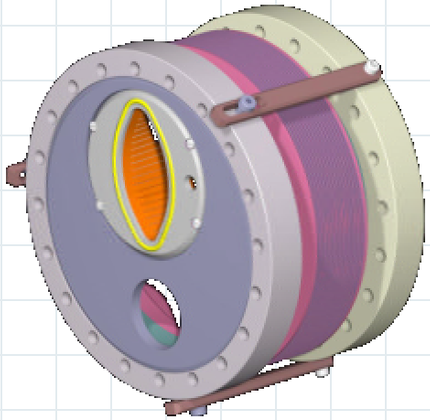


Bellows and Liners

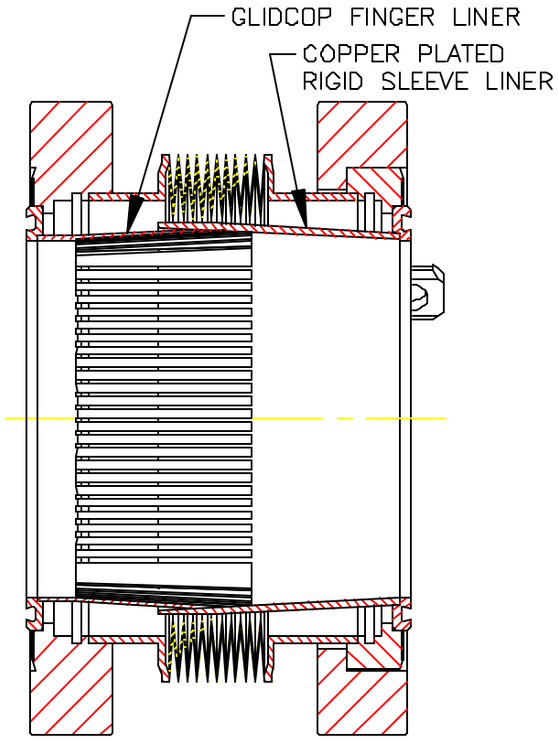


TYPE “A” BELLOWS ASSEMBLY





TYPE “B” BELLOWS ASSEMBLY



Leonard Morrison

04/02/2003

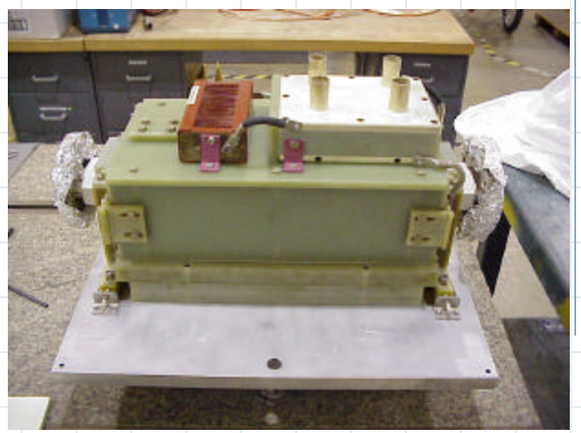
Mechanical Engineering Group

Accelerator Systems Division

Advanced Photon Source

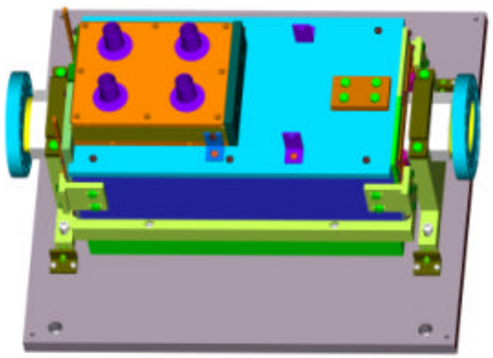
Argonne National Laboratory

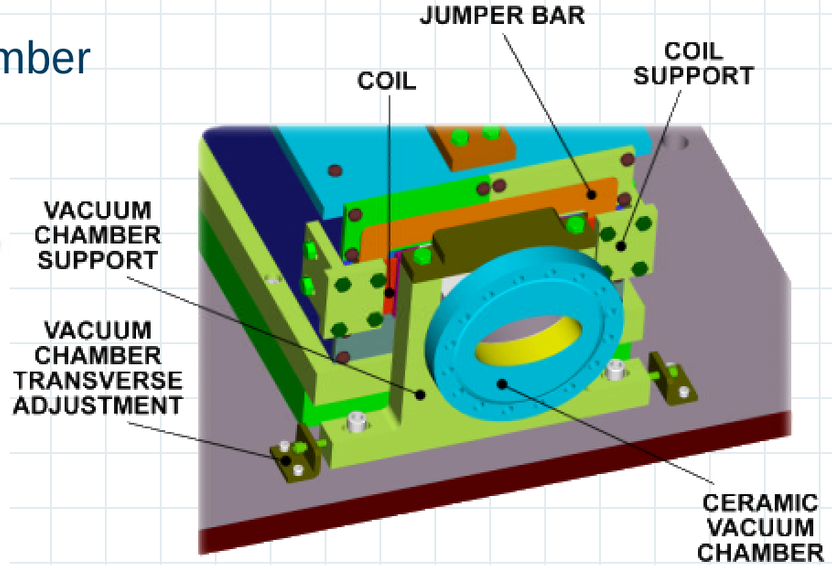
Upgraded Kicker Magnet



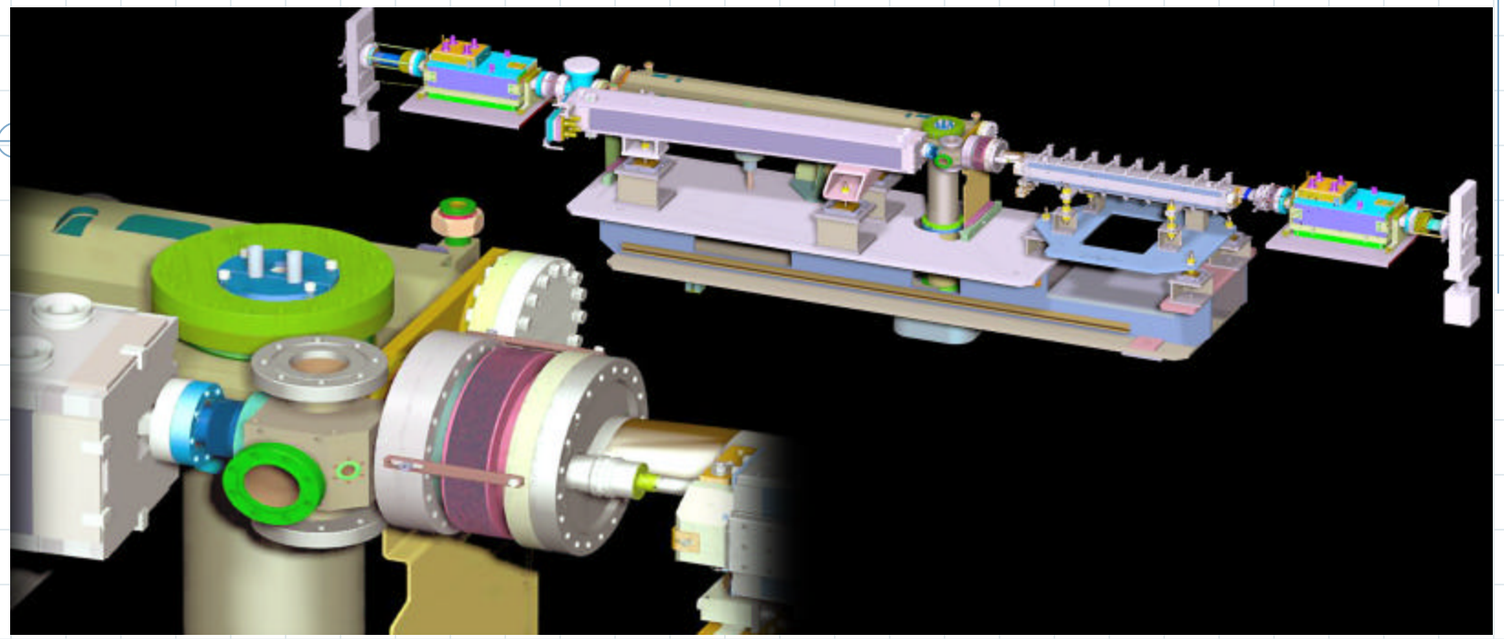
Design Changes:

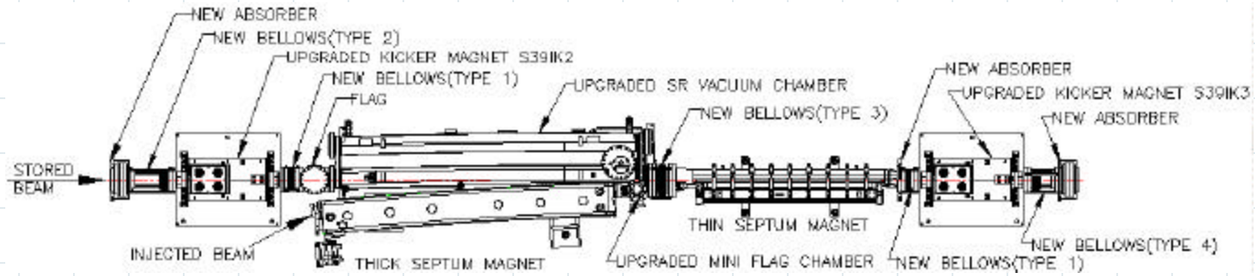
1. Machined ferrite base
2. Align and pin ferrite
3. Fiducialized the base plate
4. Adjustable vacuum chamber support
5. Coil support





Upgraded Storage Ring Injection Area





Leonard Morrison

04/02/2003

Mechanical Engineering Group

Accelerator Systems Division

Advanced Photon Source

Argonne National Laboratory