Review – IPAC Paper Concept

• Double-wall container for mercury containment

• Inner container is a hollow SS shell filled with He-cooled W beads
  – Actually provides triple-wall mercury containment in most areas

• Issue is that it allows Hg to leak into a shielding container that is not part of the mercury system

• Next step: move outer Hg containment wall inside W, segregate mercury containment and shielding functions
Inner Tungsten Shielding
Helium inlet

Mercury Vessel Helium inlet

Mercury Vessel Helium outlet

Hg chamber vent line

Maintenance Handle

Hg return

Beam pipe

Hg jet inlet

Hg drain
Prior Concept

- Hg chamber vent line
- Hg jet inlet
- Beam pipe
- Helium inlet
- Helium outlet
- Hg return
- Hg drain
Updated Concept – Separate Mercury Containment from Shielding

Double wall mercury containment inside tungsten shielding chambers

Mercury Pool

Downstream Beam Window
Segmented Mercury Interstitial Space

Upstream View From Hg Pool

Upstream View Before Hg Pool
Mercury and Shielding Modules
Double-Wall Supply & Return Piping

- Mercury requires double containment outside the mercury equipment cell
Double Containment Piping

Mercury Drain Piping

Pin-hole drains for leaks

Nozzle Inlet
Mercury Module Extraction
Cryostat Modules

- Now have three distinct modules within the first cryostat
- Could combine the shielding modules into one
Comments

- Isolating the mercury module from the shielding makes remote handling simpler
- Still a very complicated geometry and mechanically difficult to fabricate
- How much heat energy does this new mercury module have to dissipate?