

# RaDIATE

June Technical Meeting  
BLIP Irradiation Planning

June 16 2016

Radiation Damage In Accelerator Target Environments



# Meeting documents

posted on RaDIATE website

- Current meeting slides
- Updated proton energy budget
- Final version of interface document
- Specimen capsule update
  - Be/C (FNAL)
  - Al (ESS)
  - Ti (FRIB)
  - Heavy/Si (CERN)



# Agenda

- RaDIATE News
- Update on BNL BLIP
- Specimen capsule update
  - Heavy/Si capsules (CERN)
  - Al alloy capsule (ESS)
  - Ti alloy capsule (FRIB)
  - Be/C capsule (FNAL)
- Next steps
- Schedule
- All other issues



# RaDIATE News

- Registration open for [3rd RaDIATE Collaboration Meeting](#)
- Hosted by PNNL, September 7-9, 2016
- VC meeting to plan agenda/format
  - Friday, June 17<sup>th</sup> at 10 am (CDT)



# BNL BLIP Update

- Proton Energy Budget Update
  - Beryllium capsule: 2 mm layer removed
  - Graphite capsule: 0.5 mm layer added
  - Silicon capsule: 2 mm of expanded graphite (Sigraflex) added
  - Have about ~ 3.71 MeV of energy to spare
    - Vacuum degrader to account for this
  - Water in target box ~ 24 mm (less than maximum of 25 mm)
- Interface document updated and final version posted on RaDIATE website
- Any other update on BLIP operation from BNL?
  - Possibility of running for more than 8 weeks?



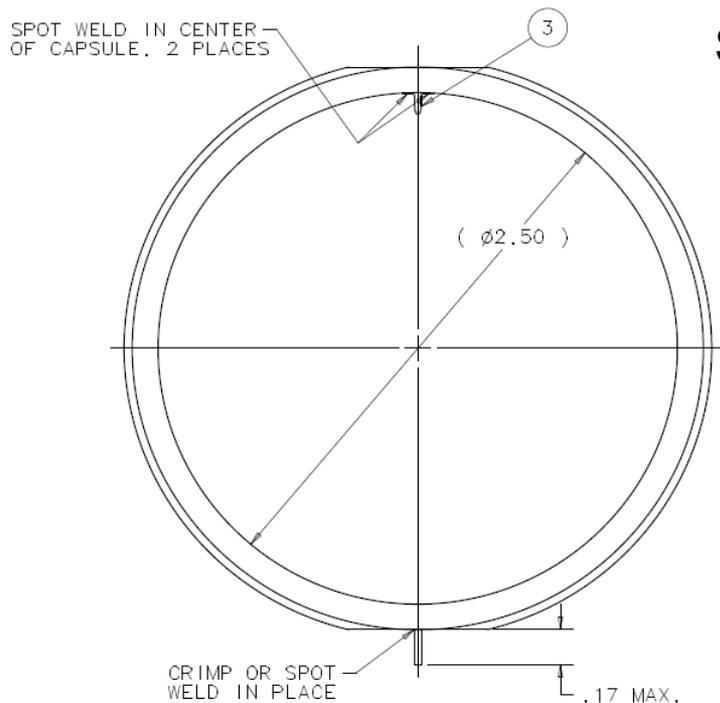
# Specimen Capsule Update

- Ir/TZM/Si capsule (CERN/KEK)
- Al capsule (ESS)
- Ti capsule (FRIB/KEK/FNAL)
- Be/C capsule (FNAL)

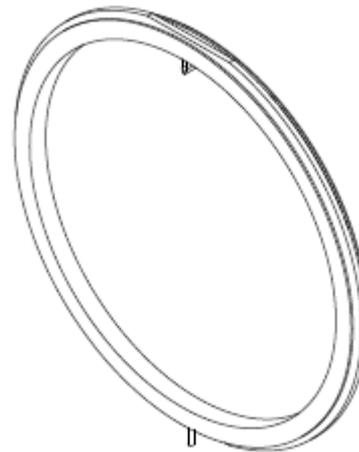


# Next Steps

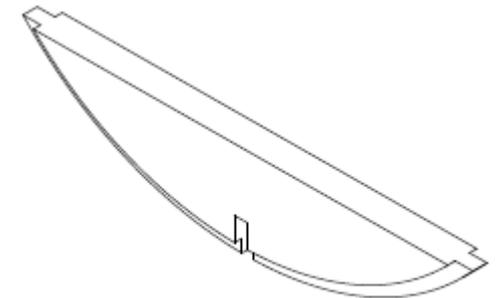
- Finalize capsule designs
  - Internal pins to prevent specimens from rotating inside capsule
  - Capsule holder design to prevent rotation in capsule basket
    - CERN design acceptable?



SS capsule



Filler part





# Next Steps

- Full Fluka Analysis (BNL)
  - Estimate activity of specimens and target box
  - Operator dose outside isotope extraction hot cell
  - Evaluate impact of proton flux degradation on isotope yield during irradiation run
  
- Vacuum degrader design (BNL)
  - Thicker outer region of SS window to account for non uniform exit energy from heavy capsule
  
- Preparation of safety document for BNL review (BNL)



# Schedule

Tasks	2016									2017			
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Finalize BLIP test matrix	█												
Capsule design and thermal analysis	█	█	█										
BNL review of capsule design			█	█									
Specimen procurement & fabrication				█	█	█	█						
Specimen capsule procurement & fabrication				█	█	█	█						
Specimen pre-irradiation characterization							█	█					
Capsule assembly, welding, leak checking								█	█				
Shipment of capsules to BNL									█				
Full FLUKA analysis of target box		█	█	█	█	█							
Safety document preparation				█	█	█	█	█	█				
Vacuum degrader design/fabrication						█	█	█	█				
Capsule holders and basket design/fabrication						█	█	█	█				
Target box assembly									█	█			
Target box Irradiation											█	█	█



Other issues & discussions?