

RaDIATE BNL BLIP Irradiation Run Planning VC Meeting

05.04.16

Present

ESS: Yongjoong Lee

FRIB: Aida Amroussia, Carl Boehlert

CERN: Antonio Perillo Marcone, Elvis Fornasiere, Claudio Torregrosa

BNL: Chris Cullen, Leonard Mausner, Nick Simos

KEK: Shunsuke Makimura

PNNL: Dave Senior

FNAL: Patrick Hurh, Bob Zwaska, Sujit Bidhar, Kavin Ammigan

Notes

- RHIC planning to run with polarized protons next year. Peak current at BLIP will be 165 μA but about 8-10% of protons will be taken away during RHIC filling. Capsule and target box analysis should be performed with peak current.
- No firm requirement on the capsule window thickness. We plan to use 0.009", as indicated in the proton energy budget.
- BNL agreed to coordinate activities for the assembly and welding of the FNAL graphite capsule. Electron beam welding will be performed at EB industries.
- EB industries also has capabilities for TIG and laser welding in inert atmosphere. If necessary, this is another option for users to weld their capsules.
- BLIP rastered beam is expected to walk by a few millimeters during irradiation run.
- All users will forward STEP files of their capsule assembly to Chris Cullen prior to specimen and capsule procurement and fabrication.
- Both Si and heavy capsules will be in vacuum, based on current thermal analyses by CERN. CERN will review thermal gap conductance in capsule!
- From experience, BNL indicated that vacuum thermal gap conductance for various target types and materials seems to fall between 500 and 1500 W/m².K.
- CERN heavy capsule currently has graphite as the filler material surrounding the specimens. BNL recommends using a different filler material to more closely match energy degradation by heavy specimens. Uniform energy degradation across capsule is required.
- Interface document was reviewed and is agreeable to all users and BNL. A couple of edits will be made and revised version will be posted on RaDIATE website:
 - BNL now coordinating welding activities with EB industries for FNAL graphite capsule. FNAL will ship capsule parts and specimens.
 - KEK procuring and fabricating SiC-coated graphite specimens.
- Bend specimens testing
 - BNL does not currently have capability to perform bending tests at elevated temperatures in their hot cells. In X-ray diffraction set-up, this will be possible with laser heating and likely be ready by end of our irradiation run.

- PNNL has capability to test at elevated temperatures
 - Up to 2000 C under shielded hood
 - Up to 1100 C in hot cell
- Gaps between specimens and fillers should be maintained between 50-100 μm . This will allow for easy assembly (avoid too tight of a fit) as well as ensure that gaps are not too large to allow a lot of beam going through.
- Users need to consider and account for packaging and shipping costs of specimens by BNL.
- Desired irradiation temperature range for beryllium specimens is 100 – 400 C.
- PIE plans of each users need to be detailed and included in BNL safety documentation.
- ESS will share routine they developed to implement rastered beam profile in FLUKA.