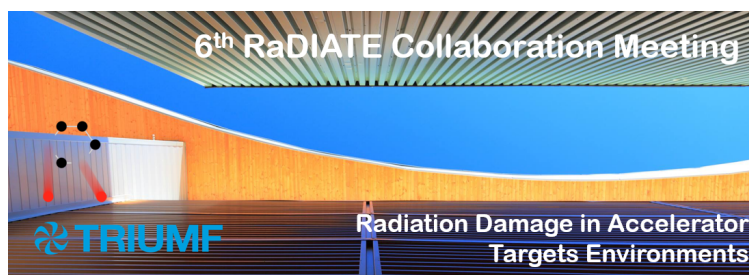


6th RaDIATE Collaboration Meeting



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Material irradiation and investigation capabilities at ISAC-TRIUMF

Thursday, 12 December 2019 12:20 (25 minutes)

ISAC-TRIUMF operates targets under proton irradiation in the high-power regime of 50 kW to produce radioactive isotope beams using the ISOL method. During irradiation, high-energy protons passing through the ISOL target are available for studies of radiation damage in materials. Additionally, the existing hot-cell capabilities for the routine maintenance of target components allow immediate in-situ material characterization of highly activated samples as well as preparation of microscopic samples with dose rates that allow hands on material investigation. Future direct proton irradiations aim to qualify materials for use in components for accelerator, fusion and fission applications as well as to investigate the radiation resistance of novel promising materials. Notably, nanostructured materials have undergone increasing interest in the nuclear industry due to an increased number of structural boundaries (grain boundaries, layers, precipitates) resulting in an enhanced radiation resistance by point-defect recombination. Although such materials have had traditionally the drawbacks of reduced ductility and poor microstructural stability, recent stabilization and grain structuring techniques might have unlocked their use as high performing materials under radiation fields.

The ongoing development of irradiation capabilities at ISAC-TRIUMF will be presented with the achievable proton and neutron fluxes, DPA rates and helium production.

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Session Classification: 9th Oral Session