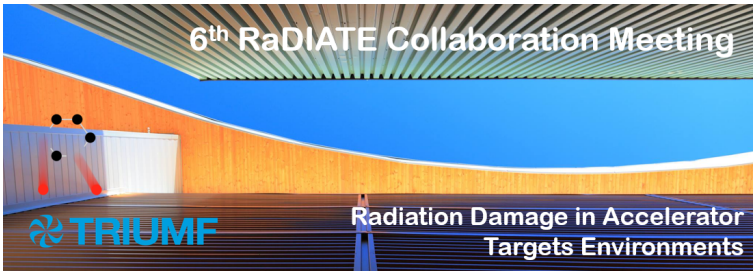

Contribution ID: **48** Type: **Poster**

High Emissivity Micro-machining for Increased Emissivity of Tantalum ISOL Target Containers

Tuesday, 10 December 2019 17:00 (2 hours)

TRIUMF's Advanced Rare IsotopE Laboratory (ARIEL) requires a new design of an ISOL target container that approaches an emissivity (ε) of 1, as is achieved at ISAC via cooling fins [1]. ARIEL's new target geometry precludes the use of cooling fins as a viable option for heat dissipation, leading to exploration of other high-emissivity options. Small-scale (μm) surface modification is considered as a way to increase the emissivity [2,3,4]. Simulations were constructed using COMSOL Multiphysics to mimic basic reflectance measurement results from literature; the same model was then used to simulate tantalum micro-geometry surface structures and report the average reflectance. Geometries were found that increased the emissivity by greater than Δε = 0.5 in a select wavelength band. Test pieces have been designed and will be used to validate the results of the simulations as well as explore the survival of the structure at ≈ 2500 K.

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