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## **M1Or1A-01: Microstructure and 77K mechanical properties of electron beam welded Cu101- Inconel 625 joints**

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In developing large-scale next-generation superconducting radio frequency (SRF) linear accelerators using superconducting films on Cu, the design and development of dissimilar welding and joining metals, such as Cu to Inconel, stainless steel, and Nb, are essential. In this talk, we present the development of procedures for electron-beam welding of Cu-Inconel 625 and evaluation of the microstructure and 77K mechanical properties of the weld and base material in the welded condition and heat treatments in the 750°C- 950°C heat treatment range. The results will be presented in the context of developing joining techniques for low-temperature applications where high conductivity and strength, vacuum hygiene, and magnetic properties of the material need consideration. The methods presented here are being deployed to thin film SRF Cu cavities at Jefferson Lab.

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