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# M2Or2A-03: In-Situ and In-Operando Monitoring of Laser and Electron Beam Welding Processes for Austenitic Stainless Steels

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Laser and electron beam welding processes are advanced manufacturing technologies that are critical for the high precision and complex geometries prevalent in cryogenic systems. Implementation of these technologies is currently reliant on high skilled labor. Furthermore, designs are pushing the process physics and the material properties to their limits. In-situ and in-operando monitoring is of high interest to control operation within these constricted process windows, to develop models and automation systems to minimize the reliance on skilled labor, and to advance the fundamental understanding of the process-structure relationships. The presentation will explore the in-situ and in-operando monitoring of laser and electron beam welding of austenitic stainless steels which are important materials for cryogenic systems.

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