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**Integrated Modeling and Characterization for U-Mo Metal Fuel Fabrication
for United States High Performance Research Reactors**

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ABSTRACT

Low-enriched uranium metal alloyed with 10 wt% molybdenum (U-10Mo) has been identified as a promising alternative to the currently used high-enriched uranium in the United States High Performance Research Reactor fleet. Manufacturing the U-10Mo alloy consists of multiple complex thermomechanical processes that impact the final fuel microstructure and fabrication. During fuel fabrication for in-reactor tests microstructural and process modeling has been closely coupled with characterization to develop a predictive modeling capability to quickly assess process parameters and provide a predictive process-modeling tool. Using an Integrated Computational Materials Engineering construct these process-modeling tools have been used to impact process parameters used for fuel fabrication. Results from the modeling activities and where and how they have impacted the characterization and processing and future plans for fuel fabrication will be presented.