

Abstract Submitted  
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**Tungsten - Yttrium Based Nuclear Structural Materials**<sup>1</sup> CHINTALAPALLE RAMANA, JACK CHESSA, GUSTAVO MARTINENZ, University of Texas at El Paso, MICHAEL LERCHE COLLABORATION<sup>2</sup> — The challenging problem currently facing the nuclear science community in this 21st century is design and development of novel structural materials, which will have an impact on the next-generation nuclear reactors. The materials available at present include reduced activation ferritic/martensitic steels, dispersion strengthened reduced activation ferritic steels, and vanadium- or tungsten-based alloys. These materials exhibit one or more specific problems, which are either intrinsic or caused by reactors. This work is focussed towards tungsten-yttrium (W-Y) based alloys and oxide ceramics, which can be utilized in nuclear applications. The goal is to derive a fundamental scientific understanding of W-Y-based materials. In collaboration with University of California – Davis, the project is designated to demonstrate the W-Y based alloys, ceramics and composites with enhanced physical, mechanical, thermo-chemical properties and higher radiation resistance. Efforts are focussed on understanding the microstructure, manipulating materials behavior under charged-particle and neutron irradiation, and create a knowledge database of defects, elemental diffusion/segregation, and defect trapping along grain boundaries and interfaces. Preliminary results will be discussed.

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<sup>2</sup>McClellan Nuclear Research Center, University of California, Davis

Chintalapalle Ramana  
University of Texas at El Paso

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