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Greetings,

On behalf of my co-authors and myself, I am hereby submitting our manuscript, entitled “A molecular dynamics study of the energetics, diffusivities, and production of point defects in gamma U-Mo under applied pressure”, for publication in the *Journal of Nuclear Materials.*

U-Mo is the fuel type of choice for the United States High-Performance Research Reactor program. Mesoscale evolutionary models are being generated and refined to describe the behavior of U-Mo fuel; however, they lack sufficient fundamental properties and parametrization to provide for accurate predictions. One key area where there is a lack of knowledge is the effect of stress state on the behavior of primary defects. Large stress fields will exist within these fuels under normal operation, leading to fission gas bubbles and creep, which are themselves poorly understood phenomena in U-Mo fuels.

In this work, we employ molecular dynamics simulations to investigate the formation energy, diffusion, and generation of point defects under applied stress. This work provides the first step towards a quantitative and qualitative understanding of how the induced stress fields in U-Mo nuclear fuel will affect microstructural phenomena dependent upon point defect behaviors.

We feel this work greatly adds to the scientific community and provides a starting point for expansion into more complex interactions of pressure with point defects.

Sincerely,

Benjamin Beeler