We thank the reviewers for their time and their constructive feedback. All comments are addressed below and have been addressed in the manuscript. A marked version of the manuscript has been uploaded and denotes all changes.

Reviewer 1:

The authors employed the angular dependent potential (ADP) for U-Mo. It would be beneficial to perform a few DFT calculations to validate this potential.

This potential has previously been compared to both experimental and density functional theory data. A full summary was not included here since this information has been presented previously in multiple publications. A more thorough justification of this potential has now been included in the methods section.

This study only considered hydrostatic pressure. It would be interesting to include one or two MD simulations to examine the effects of non-hydrostatic pressure on defect properties in U-Mo.

We thank the reviewer for this comment. We agree that different stress states are of interest and that the fuel will experience different stress conditions. A complete analysis of all possible stress states (uniaxial tension/compression, biaxial tension/compression, mixed biaxial loading, shear, etc.) is incredibly broad, and it dramatically increases the scope/breadth of this manuscript. We have conducted preliminary studies on biaxial tension/compression and observed similar, but slightly lesser, trends in defect energetics. Prior studies have shown a dependence of defect behaviors on deformation volume change [https://doi.org/10.1016/j.jnucmat.2014.12.111]. Thus, it is expected that applied stress conditions that result in large volumetric changes (such as hydrostatic stress) will yield the largest defect response. A discussion along these lines has been included in the manuscript in the methods section.

Reviewer 2:

Stability of the bcc phase of uranium: The paper mentions the instability of the bcc phase of uranium and its stabilization with Mo. It would be beneficial to reference a recent study that discusses related concepts, such as "Tunable correlated disorder in alloys" by Chaney, D. et al. (Physical Review Materials, 2021, 5(3), 035004).

We thank the authors for pointing out this reference. A discussion on the stability of the gamma phase and chemical ordering has been included in the manuscript with appropriate references.

Melting point of U-10Mo: In the Primary Knock-on Atom (PKA) section, the authors should provide the melting point of U-10Mo, including both experimental values and those obtained using the ADP potential.

While the melting point of pure U and pure Mo has been previously determined with this potential, no calculation of melting point of the alloy was found in the literature. Thus, we have performed the two-phase method to determine the melting point of U-10Mo. The ADP predicts a melting point of approximately 1620K, while the experimental melting point is approximately 1525 K. This is a reasonable, if imperfect, agreement. This information has been included in the manuscript.

Acronym definition: The acronym PKA should be defined the first time it is used to ensure clarity for all readers

This acronym has been defined the first time it is used. Thank you for pointing this out.