We thank the reviewers for their time and for their constructive feedback. We believe that we have answered all of their points, both below and in the manuscript, where applicable. We believe that the manuscript has been improved by their comments.

Comments to the author (if any):

Reviewer #1: Authors present the interesting investigation about the formation energy of point defects in U-Mo alloy. They studied in detail the impact of the various conditions (temperature, composition, pressure) on the energy. The article definitely deserves to be published. I have only the couple comments.

1. What did the version of the ADP potential the authors use? Authors wrote they used the potential developed in 2015, but in some recent articles they used the new version of this potential developed in 2018. Please, check it.

Indeed, the 2018 version of the potential has been utilized, and the citation has been updated to reflect this fact.

2. I should notice that concentration of point defects at non-zero pressure depends on formation enthalpy (H\_f) where the formation energy (E\_f) is only part of it: H\_f = E\_f + P\*V\_f. To estimate the impact of pressure on the defect concentration, the authors should calculate the formation volume V\_f for both types of the point defects. For instance, Smirnova et al. calculated this formation volume for pure g-uranium with same potential (2015 version) and discussed the available experimental data about impact of pressure on self-diffusion. [Smirnova, Kuksin and Starikov, JNM 458 (2015)]

We thank the reviewer for identifying this key point, and we acknowledge the change from a formation energy to a formation enthalpy which takes into account the pressure and the formation volume. However, due to the constraints of manuscript length, we do not believe that we can fully introduce, describe, and explain the concepts, methods, and results associated with a formation volume, while meeting the journal guidelines. We do note that a future manuscript is planned which expands upon this topic, and which will include formation volumes. We regret that they could not be included here.

If the reviewer insists on their inclusion, and the editor accepts a manuscript that exceeds the length standards, we will work to include these results in the manuscript.

A note has been included in the manuscript to highlight the absence of the formation volumes:

“Ideally, a non-zero pressure system accounts for the formation enthalpy, which includes both the formation energy and a term based upon the formation volume and the pressure of the system [14]. However, the determination of formation volumes was deemed beyond the scope of this manuscript.”

Reviewer #2: The manuscript "Analyzing the effect of pressure on the properties of point defects in γU-Mo through atomistic simulations" presents an interesting and carefully executed study of the pressure dependence of defect formation energies in U-Mo alloys envisioned to be used as fuel in research reactors. The data is generated by atomic scale simulations based on an empirical potential for interatomic forces. The analysis of the results is accurate. The topic should be of interest to the readers of MRS advances. I only have a few minor comments that I recommend the authors address before the paper is accepted for publication. Those are listed below.

1. Defect diffusion in stress fields are often modeled at the atomic scale by the dipole tensor formalism. I recommend adding some background on this approach and how the present study relates to that theory.

We thank the reviewer for the suggestion. The third paragraph in the introduction has been modified as follows:

Microstructural evolution can occur as a result of the accumulation of defects driven by short- and long-range interactions of microstructural features. A key input into creep models is the behavior of point defects under applied stress. Given an environment where potentially large local stresses are present, if the point defect formation behavior is modified due to a stress field, then the defect evolution, and thus the microstructural evolution, will be affected by that stress field. Mesoscale fuel performance simulations [4, 7, 16] take into account information such as point defect formation energies and diffusion coefficients, in addition to creep behaviors, but typically assume an Arrhenius relationship that is independent of the stress state. A knowledge of the effects of stress on the fundamental nature of point defects will allow for refinement of mesoscale evolutionary models and the parametrization of sophisticated creep models for U-Mo fuels. Elastic fields and the long-range elastic interaction between defects can be described via the elastic dipole and relaxation volume tensors [1, 5], a first step towards obtaining these quantities is analysis of their energetics.

2. Page 4, line 54: "high" should be "higher".

Corrected.

3. Page 5, line 16: "for" should be "to".

Corrected.

4. Page 5, line 38: consider deleting "of interest".

Deleted.

5. Page 5: "Under reasonable applied bulk pressures below the yield point (<100 MPa), negligible deviations in the defect formations are observed." Previous sentences seem to define an effect, but here it says that the effect is negligable. Either explain the difference or quantify what negligible means.

We apologize for the confusion in our language. We are stating that there is in fact an effect that is present, where the pressure impacts the formation energies. However, at pressures relevant to research reactors, which are not expected to exceed 100 MPa, the impact of pressure appears to be negligible. We have attempted to more clearly illustrate this point by modifying the last few sentences of the results:

“While the applied pressure clearly affects the formation energy of defects, at typical pressures relevant to research reactors (<100 MPa = 1 kbar), negligible deviations in the defect formations are observed. However, in circumstances where the pressures may be quite large, e.g., in the area surrounding a highly pressurized nanometer-sized bubble, statistically significant changes in the local defect formation energy could be observed, potentially altering fission gas bubble evolution and creep behaviors.”

6. There is no conclusion section, is that intentional?

The conclusion section was mislabeled discussion, which has been rectified.