

Peer Review

Review of: "Parameter Calibration for Johnson Cook and Preston-Tonks-Wallace Material Strength Models with Uncertainty Quantification"

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Overall, this paper is short and to the point. I think that if a conference paper or an internal report is the target, this is a good skeletal structure that needs more work. Much more work would certainly be needed to target a journal paper (and I am not sure the novelty is there to warrant a journal paper). I do have a few pet peeves (though this is my opinion):

Paper Text:

1. General Comment - Try not to use "we" in a paper or any other first/third person pronouns.....a passive tone is usually the norm, though this seems to be changing in some areas (maybe?).
2. In the introduction, is there a motivating factor for this work? Maybe existing model fits are not optimized and Bayesian calibration can do this? Again, this may not be necessary for a conference paper, but I wanted to point it out.
3. In the introduction, the mentioning of the PTW model at the beginning of the 2nd paragraph almost appears as an afterthought even though it is in the title of the work. I would include this in the first paragraph alongside the JC model.
4. The first reference used in this work is for the PTW model (pg 2)...the reference for the JC model is made on page 3, though the model is introduced on page 1. It might be better to reference the JC model paper when the model is introduced.
5. For the JC and PTW models, is it worth adding more information about the models (maybe, maybe not)? For example, the JC model is an empirical model that does well up to certain strain rates but is not good for very high strain rates. The PTW model is a physics-based model that was formulated to

cover broader temperature and strain rate ranges for materials under quasi-static to shock conditions.

6. In the Experimental section on page 3, can you expound upon the experimental conditions instead of just giving ranges? Maybe add a table that lists out all the experimental conditions for the 16 data points?
7. In the results section, you mention positive and negative correlations for certain parameters. What does this mean?
8. With regard to results, I am a bit confused. I do not see the optimized parameters for the PTW model anywhere. Is that part of this work? Or are the optimized values from the Fugate or Andrews papers being used? This should be clarified in the paper. If you are using your own optimization for the PTW model, I would also include plots for that data.
9. The same comments in 7) can also be applied to the section that removes the 77 K (big K - little k was used in the section heading) quasi-static test data.
10. For the Conclusion, I will bring up again whether or not you are calibrating a fit for the PTW model or if optimized values from other works are being used. If you are only calibrating the JC values (and using calibrations from other works), you may want to change some of the structure of this work (and possibly the title). If you are calibrating both the JC and PTW models, you will need to add quite a few more figures and discussion about the PTW calibration.

Figures:

1. Figure 1 caption - Expand the caption to be more descriptive about the data shown.
2. Figure 2 caption - Expand the caption to be more descriptive about the data shown.
3. Figure 3 and caption - What strain rate is used for this data? Is it only for one set of strain rates?
4. Figure 4 and caption - What strain rate is used for this data? Can better descriptors be used than shot_20090506_1108.....for example, maybe try Shot 1, 2, 3, or 4? Possibly add a comment regarding the Hopkinson Bar - JC prior outlier?
5. Figure 5 - Expand the caption to be more descriptive about the data shown.
6. Figures 6 - 10 - The same comments about these plots/captions are made regarding their earlier counterparts.
7. Figures 5 and 9 - These plots appear to have serrations in them....is this an image artifact? Can this be cleaned up or explained?

Declarations

Potential competing interests: No potential competing interests to declare.