

REVIEW RESPONSE LETTER [4]

Dear Reviewers,

Thank you for reading my manuscript and for the detailed reviews which pointed out the unclear points and will defiantly help me improve it. At the following I will respond all the points mentioned.

Reviewer 1:

About the spell-check, I implemented most of the points mentioned there. I thank you again for such a detailed and complete review.

About adding references, I was not sure if it is appropriate to site a reference, since there is nothing specific I would extract from any reference. I could not find any relevant literature review, and the basic material I've used is as simple as the Hook's law. Anyway, I added three references to the end. One is the IYPT site where the question is copied from, and the two others are textbooks I've used during the research. Although I'm not sure if this way of referring is correct or not, since it is not clear where exactly in the manuscript I've used these references.

"I recommend to put more emphasis onto a discussion of the experiments and of the numerical treatment, especially into the discussion of the data obtained -- their agreement or discrepancy."

I added some more explanation in the Discussion part, as it was also mentioned by the second reviewer.

"-- In equation (1), modulus μ was used. Under the equation is a note that modulus was used instead of stiffness intentionally -- suggesting that the same will hold in the rest of the paper. Replace $k := \mu/l$ in equations (2), (3) and (4)."

I agree, this was corrected in the text.

"-- Equation (4) needs to be clarified. Intuitively, a stability argument is expected."

Seems like this part was not understandable, and the analytical solution needed more explanation. I added some explanation, changing some formulas and describing the solution. However at the end I mentioned that the solution "Could be shown to be stable in the case...". I think it is enough since mentioning all the stability solution adds too much complication and many formulas to the text. Please let me know if you disagree.

"-- In equation (5), a 'hat' over x and y denotes a unit vector, but that is not true for hat above T . Use an arrow or add an explanation to the following paragraph."

Yes, T is a vector and it is corrected.

"-- Figures (2) and (3) are misreferenced in the following paragraphs."

Captions were wrong, now corrected.

"-- Paragraph below figures (2) and (3): Briefly mention how did you define a convergence in your simulation."

Yes, I added the convergence criteria.

"-- Figure (5): Draw into the photo a curve to show how did you measure the length of the spring. What is the accuracy of your method? Also, draw the scale in the photo."

In the numerical solution and experiments, the length was assumed to be the distance between the two ends of the spring. I added this to the text. I also changed the picture, since that one was not one which had scales and no measurement was done on it. It was only used for illustration. So I put a series of pictures with a scale and showing the increasing angular velocity. There is no estimation on the accuracy, since I measured the distance of 30 cm in pixels and pixels were used for the rest of the measurements.

Reviewer 2:

“- The Fig. 8 may deserve more explanations. Consider checking.”

More explanation is now added.

“- Statistical and systematical uncertainties of the measurement are not discussed or presented. Consider a small comment.”

I added some explanation as the second paragraph of the Discussion. I hope it is enough, because I don't have much more to say.

“- Consider explaining explicitly the limits of applicability for the approximation of the analytical calculation.”

I had mentioned that this approximation gives accurate results for when the additional mass is more than the spring mass. However this may not be so true. The limits of applicability depend on the precision needed in a specific application, so I cannot give a total conclusion on when it is applicable. Thus I removed the sentence about the accuracy of the analytical solution, and just mentioned that *“the analytical solution does not provide the accuracy of the numerical solution especially in small additional masses compared to the spring mass. However it is clear that the errors decrease as the additional mass increases.”*

“- Comment on the effect of possible oscillations of the spring.”

Although longitudinal oscillations occur when starting the motion, they will be damped after a few seconds. These oscillations were visible in our high exposure time photos. So naturally, we waited for the oscillations to be damped and then the data was extracted. I do not see this explanation necessary in the text.

“- Figure 2 is not discussed in the text. Please check.”

Yes, Captions were wrong. So the explanation about figure 2 was addressed as figure 3. I corrected the captions.

“- Equation 5 looks strange. Values x and y are not properly introduced.”

It is now corrected.

Editor:

“Figure 8: Please specify the units on the x-axis and the y-axis. Centimeters?”

No, meters. I now mentioned this in the caption.

“Figure 5: Consider adding a scale bar.”

I changed the picture, and added the scale bar.

I also changed the title of the manuscript to make it more descriptive.

Again I thank the reviewers for the detailed reviews, and I hope my response has been acceptable.

Regards,

Reza Montazeri Namin