REVIEWS ON THE MANUSCRIPT [4]

Reviewer 1:

This paper discusses the expansion of a rotating spring attached at one end point to the axis/center of rotation.

The theoretical model is based on Hooke's law. This is then conveyed into an analytical solution for a simplified case of a "massless" spring, as well as into a numerical treatment for a general case.

Most of the work deals with extension of the spring, though the shape is also briefly mentioned. In the end, both models are compared with experimental results obtained by the author himself.

The work is well structured. Smooth reading and clear argumentation, however, often interferes with many language errors. Since their list is rather long, I marked them in color in an attached file. Search for text in yellow highlight. Red struck-out text I consider redundant and it should be omitted. Green underlined sentences strongly need to be improved.

I am also surprised that the author does not cite any articles on the topic and does not build on them. Since the presented theory is well-known, 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.

Further remarks:

-- 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 $k := \mu/l_0$ in equations (2), (3) and (4).

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

-- 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.

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

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

-- 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.

Recommendation:

The presented paper can be published, but only after making appropriate changes as proposed in this review.

Reviewer 2:

The studies of the rotating spring, as described in the paper, look interesting.

The several experiments and numerical estimation are presented, as well as an analytical approximation. All presented results are in a consistent agreement;

however the statistical or systematic uncertainties are not shown or commented on. That makes it difficult to judge further on the results.

The approximation of a massless spring for the analytical calculation is considered, but the limits of applicability for this approach are not sufficiently clear.

The manuscript is recommended to be accepted.

Several suggestions, possible improvements or comments are listed below:

- The Fig. 8 may deserve more explanations. Consider checking.
- Statistical and systematical uncertainties of the measurement are not discussed or presented. Consider a small comment.
- Consider explaining explicitly the limits of applicability for the approximation of the analytical calculation.
- Comment on the effect of possible oscillations of the spring.
- Figure 2 is not discussed in the text. Please check.
- Equation 5 looks strange. Values x and y are not properly introduced.

Editorial request:

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

Figure 5: Consider adding a scale bar.