

REVIEWS ON THE MANUSCRIPT [25]

Reviewer 1:

The paper is difficult to understand with poor English and structure. The paper should be rejected.

I cannot read the formulae at the bottom of page 1: they come out very strange with boxes.

Also, I do not understand why the author introduces an extra attracting magnet at the base plate. This magnet is not in the Levitron design as far as I understand.

The references are incomplete.

Reviewer 2:

Comments

The paper presents a simple analysis of the stability region in Levitron's motion and some results from experiments which are not described in the paper.

The strongest and weakest aspect of the paper

The strongest aspect of the paper is a simple mathematical and qualitative analysis of the spinner.

The weakest aspect is the lack of details of experimental setup – the reader only gets the final result and no experimental method.

Organization and presentation

The structure of the paper is a bit messy and therefore not easy to follow. The Author should reorganize it, starting with some arguments for the stability of such a system and then try to explain the model.

The experimental details should be given together with the description of the setup. There are also some minor comments:

- divide the text into clear and distinct parts - this is very convenient for the reader.
- add 'Abstract' which would summarize the paper: approach, methods and results (few sentences).
- the formulas for B_y and B_z do not render properly - one can't read any of them. As they are not crucial for the paper, such a big font is unnecessary.

Style

The message of the article is clear. However, it has some language drawbacks (there are almost no articles *the*, *a*). Please consult someone more fluent in English to improve the language. Please use the spell check as well (*conceder* → *consider*).

Additional questions

- Be more specific about the 'model' and 'fitting'. What do you call the model? Describe it in a few sentences at the beginning.

What parameters are being fitted? Where do other parameters come from? You should list the parameters of the setup because the experimental values given are specific for this system.

- What does your experimental setup look like? How are the measurements performed? How are the results interpreted?
- The plot of vertical force vs. vertical distance is unclear. Please specify what 'model' is. How are the measurements performed?
- Add several sentences concerning the destabilization of motion - why and when does it happen? What are the important quantities?

References

When citing an article, please specify also the journal name, volume, page and year. This form of references is hard to use. An example (a very interesting article concerning Levitron as well) is the following:

[1] M.D. Simon, L.O. Heflinger, S.L. Ridgway, *Spin stabilize magnetic levitation*, Am. J. Phys **65**, pp. 286-292, 1997.

Recommendations

The article is valuable, but needs major revision.

- Try to apply all the changes proposed in the review.
- Edit the text to clarify the structure and improve the language.
- Pay more attention to the experiments and describe them more extensively.
- Answer all of the questions above.

Summary

The article is recommended for publication only after a **major** revision and reorganization.