Review Response Letter [23] Levitating Spring

We thank the reviewers for reading and reviewing our manuscript. At the following the points mentioned by the reviewers will be discussed.

Reviewer 1:

"In the denominator of Eq. (1) should be r_3 instead of r_2 – must be corrected."

The equation we used was correct, since r hat was used as the unit vector of r. But it is now changed to the format you preferred.

"Page 2, line 7 from the top: Why the two current loops should cancel the magnetic field in the inner area? Figure2 clearly shows that the bottom magnet produces nonzero field in the inner area. Please, explain or correct. In my opinion, the currents in both (inner and outer) loops should be the same."

They do not cancel the magnetic field, but they cancel the magnetization of the space inside the inner loop, meaning that it is not a magnetic material. Some explanation is added.

"Can be numerical values of the models of magnets (e.g. currents and radii of loops) shown in the manuscript? This information can be very interesting for the reader. To the equations (3)-(5): The magnetic force calculation was explained earlier in the manuscript. Can be also the numerical values of the mass and the dimensions of the top shown in the manuscript?"

Yes, some information is now provided.

Reviewer 2:

"It could be made clearer how the measured values for the magnetic fields in figure 3a were obtained. I assume with some kind of magnetometer."

Figure 2 does not show magnitudes, it only illustrates directions of the magnetic field, simply measured with a needle compass. Some explanation is now added.

Reviewer 3:

"What were the details of the experimental setup? Describe it briefly in a few sentences and/or in a photo/scheme."

Some explanation was added.

"Without the parameters of the Levitron given, the values of ω are not illustrative. You could also add a citation to a paper presenting various limitation of this type (e.g. your reference [2])."

We now mention the model of the levitron used at the introduction, which's properties could be found at the official Levitron website.

"How is the fig. 3a generated? How were the measurements conducted? More details are needed in this part."

Some Explanation added, as also mentioned by the first reviewer. Units also added.

"All figures the tiny axes description; please enlarge it to be readable."

Figures and Axis's have been enlarged.

"Is it possible to generate a theoretical value for $\omega_{spin}/\Omega_{precession}$?"

For now, we have no idea! This is just an observation from the results of the numerical theory.

Editorial request

Et all: et al.
Figures 3b, 5b: provide units on the x-axis.
gr: g
Ref. 4, 5: provide more detailed and accurate references.

All done.

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Again we thank the reviewers and editors for reading and reviewing our manuscript, and we hope our response has been acceptable.

Regards,
Alireza Tahmaseb Zadeh
Reza M. Namin