Peer Review Group A

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1 Introduction

Overall the intermediary report is well-written and at a very advanced state in the project. The authors show a deep understanding of DOE methods. Nevertheless in this review we aim to point out ways in which the report could be improved.

2 Constructive Criticism

2.1 Focus on Objective

One thing that could be improved is the focus on the objective of the project. The goal is to find the configuration with shortest traversal time, not to model the system perfectly. While a good model is of course an important step towards the goal, the report could benefit from making it clearer why and how a good model is a step towards finding the optimal configuration.

2.2 Analytic Solution

Some more explanations can be added to clarify why the analytic solution is useful, while emphasizing that it should not divert attention from determining the weight positions that minimize transit time. At the moment, the section ends abruptly and does not really go somewhere. Of course this could be due to the nature of an intermediary report and for the final submission we expect, that it will be tied into the discussion of the results. Nevertheless, one could use the groundwork already laid by the section to predict which area of the experimental domain is the most interesting, since the goal is to find the shortest traversal time, when deciding on a DOE or arguing why the experiment can be modeled as linear model with interaction.

2.3 Angle of release

There can be confusion for the position of the center of mass since the starting angle is specified to remain fixed. It is stated, that $\theta = 0$, but also the cylinder is aligned such that the center of mass is highest, which implies $\theta = -\Phi$. If the second option is used, the number of possible configurations is reduced by a factor 4 due to symmetry, but it could be experimentally challenging to correctly align the cylinder. Furthermore, by ignoring the starting angle, a significant part of the experimental domain is removed. Therefore, it should be stated in the definition of the goal, that the best configuration under a specific choice of angle is wanted, since in general a configuration of the weights includes an angle as a degree of freedom.

2.4 Small nitpicks

The following is just a list of possible very minor stylistic improvements.

- Inconsistent capitalization, abbreviation and spacing to number of "eq." "Matrix", "table" and "Fig."
- Why is one design relegated to the appendix (Fig. 6)and not shown together in Fig. 3 and Fig. 5. Additionally, the caption for Fig. 6 does not include all necessary information and the ordering of (a) and description is reversed compared to previous convention.
- Would be nice to add total number of possible configurations in $r \times I$ space, not just how many r and how many I, since as pointed out, they are correlated.
- Would be a good idea to add more explanations about candidate exchange algorithm, what it does and why it is useful.

3 Conclusion

In Conclusion, while there are some minor improvements possible, outlined in the previous section, the intermediary report is in a good shape. Overall the report shows great promise for the final project.