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## †Notes that came in the template

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Please use "sentence case" for title and headings (capitalize only the first word in a title (or heading), the first word in a subtitle (or subheading), and any proper nouns).

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Place figure captions after the first paragraph in which they are cited. (example figure commented out)

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## Abstract

†max 300 words

†no citations, minimal abbreviations if any

The abstract. Summary of what we did, what we got, etc.

## Introduction

Very similar to the previous introduction: talk about the error propagation V model discrepancy curve, (briefly) about what our model is, why we want to "improve" the model, and define notation for a generic model.

Possibly also introduce screening, surrogate modeling, and sobol indices here too? So we have this section have all the math for a generic model and the methods section is about combining them and using them on a specific model?

†Majority of citations here

†Note any relevant controversies or disagreements in the field?

Conclude with a brief statement of the overall aim of the work and a comment about whether that aim was achieved

<b>Materials and methods</b>	12
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Introduce specific information about the model	14
Introduce the specific data we have	15
Define exactly what our QoI is, what we are trying to minimize, etc.	16
Discuss the added “0th” step of building parameter distributions due to our specific	17
model’s behavior	18
Discuss our specific choice of surrogate	19
Discuss optimization specifics	20
<b>Results</b>	21
Very similar to previous paper - show overall improvement and talk about how few	22
parameters were moved and how little they were moved.	23
Possibly talk about convergence of parameter distributions? Possibly talk about	24
intermediate optimization results?	25
<b>Discussion</b>	26
Same as before - talk about what this helps us know about the model and how doing	27
OAT optimization would have moved some parameters in the wrong way	28
<b>Conclusion</b>	29
Its a conclusion. Wrap everything up, re state key things obtained	30
<b>Supporting information</b>	31
<b>S1 Fig. Bold the title sentence.</b> Add descriptive text after the title of the item	32
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## Acknowledgments

## Author Contributions

‡Not all needed, these are all the categories listed on the website

**Conceptualization**  
**Data Curation**  
**Formal Analysis**  
**Funding Acquisition**  
**Investigation**  
**Methodology**  
**Project Administration**  
**Resources**  
**Software**  
**Supervision**  
**Validation**  
**Visualization**  
**Writing – Original Draft Preparation**  
**Writing – Review & Editing**

## References

1. Conant GC, Wolfe KH. Turning a hobby into a job: how duplicated genes find new functions. Nat Rev Genet. 2008 Dec;9(12):938–950.
2. Ohno S. Evolution by gene duplication. London: George Alien & Unwin Ltd. Berlin, Heidelberg and New York: Springer-Verlag.; 1970.
3. Magwire MM, Bayer F, Webster CL, Cao C, Jiggins FM. Successive increases in the resistance of Drosophila to viral infection through a transposon insertion followed by a Duplication. PLoS Genet. 2011 Oct;7(10):e1002337.