

Author's Response

-Otto M. Lamminpää

Response to additional comments by the Editor:

1) In reference to my general comment 1, the first paragraph of Section 2 discusses the potential to enforce physical constraints, such as parameter bounds, during the GP training process. This is an important aspect, and I suggest the authors include a few more sentences explaining how this issue is handled within their retrieval application.

2) In their response letter, the authors acknowledge the mathematical parallels between GPs and the OE/OI framework (e.g., both employing Gaussian assumptions). However, this discussion does not appear in the updated text.

3) The authors note, "L46: We will consult the Algorithm team to get specific numbers and statistics", but they did not include this information in the revised manuscript.

Reply:

- 1) Added discussion and clarification on how the training data spans the intervals containing the maximum and minimum values of each input parameter, and that within those limits GP regression can be seen as interpolation. Furthermore, if the input point is outside that interval, prediction uncertainty is large by design.
- 2) We have added a remark in section 2.1. outlining the similarities and differences between OI/OE and GPR.
- 3) We have added a reference and a sentence stating that approximately 1/3 of measurements are currently processed.