

Review 1

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Review

General Comment

The project appears to have genuine scientific value. Because the topic is complex, it is important to carefully elaborate the technical concepts for a non-expert audience. The writing quality is very good.

Positive Aspects

- The abstract clearly explains why SSH mapping and reduced computational cost matter.
- The project seems well advanced, relying on established datasets and protocols, with thorough multi-scale evaluation metrics; the results appear convincing.
- Good perspective: the abstract outlines meaningful future extensions and applications.

Negative Aspects

- Many abbreviations are used, making it difficult for someone without background knowledge. The title also uses unclear abbreviations (e.g., “SWOT era”).
- In the background section, provide a source for the 90% statistic, and expand the description of 4DVarNet.
- In the aim section, specify quantitatively what “preserves mesoscale fidelity” means.
- In the methods section, explain “multi-scale residual design” and specify the structure of the networks used.
- In the expected results section, results are already obtained. Additional figures with statistical analyses (e.g., variance across different ocean regions) would strengthen the section.

The quality of writing is excellent.

Reviewer's confidence

2: Partly, I may be missing some concepts or elements of the state-of-the-art, but I got the main idea.

Usage of LLM

2: Yes, a bit.

Confidential remarks for the program committee

(None provided)