Everything else

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Posters 1

[KSxAOV1I-07] A machine-learning NEMO-emulator for regional ocean ensemble climate projections

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Digital Twins of the ocean require computationally efficient methods to deliver timely climate projections and quantify uncertainty. This work explores the development of a forcing-conditioned machine learning surrogate for regional ocean circulation that can emulate numerical model predictions at a fraction of the computational cost. A convolutional neural network based on a U-Net architecture is trained on ocean state variables and atmospheric forcing to predict the future surface ocean state. Initial experiments demonstrate the feasibility of learning the relationship between forcing and ocean response, providing a first step towards a fast surrogate model for regional ocean climate projections. Future work will extend the approach to three-dimensional predictions and investigate its use for generating large regional climate projection ensembles, supporting uncertainty quantification.

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