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Deep learning for ensemble forecasting

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Ensemble prediction systems are an invaluable tool for weather prediction. Practically, ensemble predictions are obtained by running several perturbed numerical simulations. However, these systems are associated with a high computational cost and often involve statistical post-processing steps to improve their qualities.

Here we propose to use a deep-learning-based algorithm to learn the statistical properties of a given ensemble prediction system, such that this system will not be needed to simulate future ensemble forecasts. This way, the high computational costs of the ensemble prediction system can be avoided while still obtaining the statistical properties from a single deterministic forecast. We show preliminary results where we demonstrate the ensemble prediction properties for a shallow water unstable jet simulation on the sphere.