

GENERATIVE MODELLING FOR A STOCHASTIC ROTATING SHALLOW WATER SYSTEM

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The stochastic parametrisation of subgrid scale processes is required in the estimation of uncertainty in weather and climate predictions, to represent systematic model errors arising from small scale fluctuations. In recent work, we have developed a generic methodology for calibrating the noise in fluid dynamics SPDEs, where the stochasticity was introduced to parametrize such subgrid scale phenomena. For this, we used a principal component analysis (PCA) technique based on the ansatz that the increments of the stochastic parametrization are normally distributed.

In this new work, the PCA technique is replaced by a generative model technique. This enables us to avoid imposing additional constraints on the increments. The methodology is tested on a stochastic rotating shallow water model with the elevation variable of the model used as input data.

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