A stochastic vorticity equation: analytical and numerical properties

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The aim of this talk is twofold. First, I will present a methodology for proving existence of a unique global strong solution for a stochastic two-dimensional Euler vorticity equation driven by noise of transport type. In particular, I will show that the initial smoothness of the solution is preserved, using an approach based on a liniarised approximating sequence. Second, I will refer to the numerical properties of this equation by introducing a probabilistic pathwise approach to effectively calibrate the stochastic parameters in the transport noise part. I will show that the calibration can be performed in an optimal way to match a set of given data, and the model is robust with respect to the stochastic parameters.

This work is based on:

[1] *Well-posedness for a stochastic 2D Euler equation with transport noise*, Stochastics and Partial Differential Equations: Analysis and Computations, 1-48 (2022) (with D. Crisan).

[2] *A pathwise parameterisation for stochastic transport* to appear in the STUOD Springer Proceedings (with W. Pan).

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