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Stochastic parameterization for large eddy simulation of climate flows

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Recently, stochastic, as opposed to deterministic, parameterizations are being investigated to model the effects of unresolved subgrid scales (SGS) in large eddy simulations (LES) of geophysical flows. We analyse such a stochastic approach in the barotropic vorticity equation to show that (i) if the stochastic parameterization approximates the actual SGS stresses, then the solution of the stochastic LES approximates the ‘‘true" solution at appropriate scale sizes; and that (ii) when the filter scale size approaches zero, the solution of the stochastic LES approaches the true solution.