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An energy consistent stochastic 2 layer QG model

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We derived a stochastic version for the 2-layer quasi-geostrophic (QG) equations based on its Hamiltonian formulation. The stochastic terms have been introduced in such a way that the total energy is conserved and a parameter ε, depending on the different time scales, has been introduced to separate the barotropic and baroclinic modes. The estimation of the stochastic parameters is derived from the outcome of a fine grid simulation. Next we will perform a stochastic mode reduction on the system, i.e. the baroclinic mode will be eliminated and we will derive an effective model only for the barotropic mode. We aim to develop a suitable stochastic solver in such a fashion that the resulting numerical model will be energy conserving. In our presentation we will discuss the results.