Kinetic energy backscatter in the ECMWF IFS

G. Shutts

Met Office, Exeter,UK (glenn.shutts@metoffice.gov.uk)

Recent attempts to account for model error in ensemble prediction systems using a form of stochastic kinetic energy backscatter will be described. The idea of the backscatter scheme is to compute the rate of dissipation of kinetic energy arising from numerical terms and from physical parametrizations (excluding vertical mixing) and introduce a fluctuating vorticity source term into the forecast model equations that returns a proportion of this energy back to the flow. The spatial and temporal form of the vorticity forcing function is controlled by a cellular automaton pattern generator and it's amplitude is proportional to the square root of the local dissipation rate.

The backscatter scheme is shown to be an effective means of generating EPS forecast member spread and the better matching of spread to forecast model error growth leads to encouraging impacts on forecast skill.