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Could MEP be useful for parameter tuning in GCM?

Salvatore Pascale (1), Jonathan M. Gregory (1,2), Maarten Ambaum (1), and Remi Tailleux (1)

(1) University of Reading, Department of Meteorology, Reading, United Kingdom (s.pascale@reading.ac.uk), (2) Met Office Hadley Centre, Exeter, UK

One of the main uncertainties in General Circulation Model is the presence of empirical parameters. Some of them are very poorly constrained by theory and climate turns out to be very sensitive to them. The idea has been proposed of using entropy production and kinetic energy dissipation as objective functions for parameter tuning (Kunz et al., 2008), relying on the validity of the Maximum Entropy Production conjecture.
By using the entropy diagnostics developed for the HadCM3 model (Pascale et al., 2010), we investigate the possibility of applying this idea for two parameters indicated as crucial in the QUMP study (Quantifying Uncertainty in Model Predictions, Murphy et al., 2004), the convection entrainment rate and the cloud-to-droplet conversion rate.
A maximum in the APE generation is found for values close to those normally used in HadCM3 while the material entropy production does not show any peak. The experiment also highlights the difficulties in interpreting MEP for complex GCMs and of defining the boundary conditions under which it might be valid.