



The impact of stochastic physics on climate sensitivity

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The inclusion of stochastic physics schemes has become common-place in short and medium-range numerical weather prediction models, where a beneficial impact on both the mean and spread have been reported. The impact on the long-term climate of the model is less well understood. We examine the impact of the ‘stochastically perturbed parametrisation tendencies’ scheme (SPPT) on the fully coupled climate model EC-Earth. We show that this scheme notably increases the climate sensitivity of the model, as well as altering the underlying mean state of a number of variables, suggesting that the inclusion of such schemes can be expected to shift the model to a genuinely new attractor. The increase in climate sensitivity is linked to systematic changes in the distribution and water content of clouds due to SPPT.