Representing Model Error in the Community Earth System Model

Developed initially for numerical weather prediction, the inclusion of stochastic parameterizations not only provides more skillful estimates of uncertainty, but it is also extremely promising for reducing longstanding climate biases and is relevant for determining the climate response to forcings.

Two commonly used stochastic parameterization schemes are the stochastic kinetic-energy backscatter scheme (SKEBS) and the stochastically perturbed parameterization tendency (SPPT) scheme, which recently have been implemented into the Community Earth System Model.

This seminar will report on the impact of these schemes on systematic errors, extreme events, variability and the dominant modes of low-frequency behavior, such as the North Atlantic Oscillation Pattern and the Pacific North American pattern. In coupled simulations, SPPT reduces the amplitude in the power spectra of sea surface temperatures in the El Nino 3.4 region, leading to a better agreement with observations.