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On the impact of stochastic parametrisations in the ECMWF seasonal forecasting system

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Seasonal climate predictions several months ahead based on dynamical atmosphere-ocean GCMs are part of the routinely operational forecasts issued by the European Centre for Medium-Range Weather Forecasts (ECMWF). Here, the seasonal forecasting system is a seamless extension of ECMWF's medium-range ensemble weather forecasting system for the atmosphere coupled to a state-of-the-art ocean model. Model uncertainty in the atmosphere is represented by two schemes, the Stochastically Perturbed Physical Tendency (SPPT) scheme and the Stochastic Kinetic Energy Backscatter (SKEB) scheme. This contributions looks at the impact of these two stochastic parametrisation schemes on the model performance for seasonal forecasts. It is found that these schemes reduce long-standing model biases in the Indonesian warm pool area dominated by intense convection. The simulation of MJO events in the seasonal forecasts has improved due to the stochastic parametrisations. Both schemes substantially increase the ensemble spread for El Niño SST forecasts and thus make the ensemble forecasting system better calibrated. In addition, the stochastic parametrisations also have a positive effect on the simulation of atmospheric quasi-stationary circulation regimes over the extratropical Pacific-North America region.