



Seasonal ensemble prediction systems (EPS) for global weather regimes

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The two global weather regimes, Arctic Oscillation (AO) and the Pacific North American (PNA) patterns, have impacts on localized surface variables, and thus can be useful for regional seasonal forecasting. A simple GCM (N. Hall), used in prediction mode with the forcing anomaly persistence assumption, shows a deterministic skill in predicting AO and PNA patterns. Then, we perturb the initial conditions and the forcing prescribed to the model to produce seasonal ensemble forecasts, and we consider the prediction of the AO and PNA indexes. The small number of available cases of study limits the probabilistic validation of the EPS: we have to adequately choose the predicted ensemble size to compute the decomposition of the Brier score. This measure shows a lack of reliability, due to under-dispersive ensembles, if we only perturb the initial conditions (IC). The combination of IC and forcing perturbations improves the reliability of our EPS and shows significant improvements of the resolution compared to the climatology. We also obtain a significant economic value in some specific cases with our EPS.