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Evaluation and superensemble forecasting for decadal predictions of sea surface temperature

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Using decadal prediction experiments from BCC-CSM1.1, GFDL-CM2.1, MPI-ESM-LR, FOAM-EAKF and FOAM-NUDGING initialized every year from 1960-2004, we evaluate the prediction skill of sea surface temperature over the North Pacific and North Atlantic. The evaluation results show that the prediction skill in the Atlantic is substantially higher than in the pacific. The poor skill in the North Pacific is caused mainly by the failure to predict the warm events in the 1960s and the climate shift in the mid 1975s at the leads of 2-5 years and 6-9 years. In terms of Anomaly Correlation Coefficient (ACC), the Coupled Global Climate Models (CGCMs) has a better prediction skill than the persistence in the North Pacific for forecast leads greater than 6 year, albeit not significant at the 10% level. In the Atlantic, the Multi-Model Ensemble mean (MME) of Atlantic Multi-decadal Variability (AMV) resembles closely the observation and shows a climate shift from the cold to warm years around 1990. The multi-model Superensemble (SUP) forecast is compared with the MME and individual models for the average of forecast leads 2-5 year. It is found that the prediction skill of SUP is significantly higher than the best single model but only slightly higher than the MME for the 30-year running period during the forecast period 1990-2004.

Biography

Pan Mengting is a Doctoral candidate majored in Meteorology from Nanjing University of Information Science and Technology, China. She has made some researches on the evaluation and improvement of decadal predictions based on CMIP5 models. In recent years, She has participated in many projects focusing on ensemble forecast.

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