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Title: Methods for the Seasonal Prediction of Winter Temperature in China
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Abstract:
 The seasonal temperature prediction is more important than the precipitation prediction in winter. Thus it is necessary to design different seasonal forecast systems to provide the probabilistic and determinable temperature forecast. The seasonal mean (DJF) temperature during 1983-2012 was calculated by using the monthly temperature in 160 weather stations of China. In order to obtain the dominant patterns of winter temperature, the empirical orthogonal functions (EOFs) were applied to DJF temperature. The leading EOF was characterized by uniform warm over most areas of China except western southwest China and eastern Tibetan Plateau. The first three EOFs can explain 79% of the total variance of winter temperature. Considering the interannual variation of the first three PCs can well represent the varibility of winter temperature. We regarded the first three PCs as the predictands. The correlation coefficients among previous global SST from September to November and three predictands were calculated, respectively. The highly correlated SST regions in October are selected to construct the SST indices. These SST indices were used as predictors to establish the regression equations for the three predictands. When the three PCs were forecasted, they were projected to the eigenvectors to achieve the determinable winter temperature prediction. Furthermore, the cross validation was performed to estimate the prediction skills of the statistical model. ^M
Except for the statistical model, we also analyzed the performance of the NECEP CFS2 in the prediction of East Asian winter monsoon, the Siberian High, and the blockings around Ural and Okhotsk. According to the assessment of the prediction skills for these atmospheric circulations, the probabilistic forecast of winter temperature was provided.^M
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