



Information-based potential seasonal climate predictability

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In this study, the potential predictability of the northern America (NA) surface air temperature was explored using information-based predictability framework and ENSEMBLE multiple model ensembles. The emphasis was put on the comparison between information-based and conventional SNR (signal-to noise ratio)-based potential predictability, and the optimal decomposition of predictable component using the method of maximizing the predictable information (or equivalent the maximum of SNR).

It was found that the conventional SNR-based measure underestimates the potential predictability, in particular in these areas where the predictable signals are relatively weak. The most predictable components of the NA surface air temperature can be characterized by the interannual variability mode and the long term trend mode. The former is inherent to the tropical Pacific sea surface temperature (SST) forcing such as ENSO (El Nino and Southern Oscillation) whereas the latter is closely associated with the global warming. The amplitude of the two modes has geographical variations in different seasons. Furthermore, the possible physical mechanisms responsible for the two most predictable modes and the potential benefits for the improvement of actual prediction skill were discussed.