



Wintertime ENSO teleconnection with spring European climate

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El-Niño Southern Oscillation (ENSO) is one of the most most important contributors to global interannual variability. Its impact on climate variability has been examined extensively for different parts of the world and for different seasons. Existing literature provides evidence for ENSO-related signal in both measured and modeled data. It has been also demonstrated that ENSO impact on European climate is quite weak, but still detectable and statistically significant. In this study, an atmospheric general circulation model (AGCM) developed at the Abdus Salam International Centre for Theoretical Physics (ICTP AGCM) has been used to investigate ENSO impact on European climate. The same model, but coupled with the simple ocean mixed layer in North Atlantic, was used to analyze possible role of extratropical Atlantic and contribution of sea-atmosphere interactions. It is found that during wintertime ENSO events, tropical Pacific and North Atlantic may be connected by so-called atmospheric bridge. This connection enables the tropical Pacific to affect sea-surface temperatures (SSTs) in North Atlantic during the winter. Persistence of the SSTs allows delayed wintertime ENSO impact on spring precipitation over the NAE region. Obtained results have also revealed that wintertime ENSO influence on European climate with time delay of one season is a result of two contributing processes: the persistence of the wintertime ENSO signal in the stratosphere and the atmosphere-ocean interaction in the North Atlantic. According to the numerical simulations, the memory of the ocean mixed layer is stronger than that of the stratosphere. In this manner, the presented results emphasize the North Atlantic as a contributing factor which links wintertime ENSO and spring European climate.