



The potential role of North Atlantic decadal climate processes for the European summer climate

Rohit Ghosh (1), Wolfgang Müller (2), and Johanna Baehr (3)

(1) Max Planck Institute for Meteorology, Germany, (rohit.ghosh@mpimet.mpg.de), (2) Max Planck Institute for Meteorology, Germany, (3) University of Hamburg, Germany

North Atlantic decadal to multidecadal variations have shown to have a clear impact on the North Atlantic/European climate. Whereas for the winter climate the remote response is well described, lesser attention is given to the summer climate response. Previous studies, however, indicated a significant relation between the decadal scale oscillations of Atlantic sea surface temperatures (SST) and European summer climate. Governing processes include baroclinic responses to subtropical SST but also the inference of geostrophic adjustment to local extra-tropical diabatic heating. The aim of this work is to identify the observed remote response for the central European summer climate and to assess its potential for seasonal to decadal scale prediction.

We successively investigate the atmospheric pathway from North Atlantic SST to summer European land temperatures in the 20th century reanalysis. Preliminary results from a correlation analysis using observed tropical SST and surface pressure underline an atmospheric east-west wave like pattern associated with European summer temperatures on a decadal time scale. To further establish this relation, we also consider upper level parameters such as velocity potential, geopotential and stream function. The effect of local extra-tropical diabatic heating is also considered using the thermodynamic energy equation assuming steady state.