



Diabatic heating and jet stream shifts: A case study of the 2010 negative NAO winter

Tim Woollings (1), Lukas Papritz (2), Cheikh Mbengue (1), and Thomas Spengler (2)

(1) Dept of Physics, University of Oxford, UK, (2) Geophysical Institute, University of Bergen and Bjerknes Centre for Climate Research, Norway

The role of extratropical diabatic heating in the variability of storm tracks and jet streams remains an important open question. We analyse the role of diabatic heating in observationally constrained analysis data for the 2010 winter, which was notable for an extreme southward shift of the North Atlantic eddy-driven jet. An isentropic slope framework is employed by which the contribution of diabatic terms to the maintenance of seasonal mean baroclinicity can be quantified. This reveals a striking contrast between the eastern North Atlantic, where the latent heating shifted south along with the storm track in 2010, and the western North Atlantic, where the latent heating remained fixed over the Gulf Stream. This motivates the hypothesis that the latent heating may contribute to the anchoring of the storm track entrance over the Gulf Stream but provide a very different feedback on the jet variability downstream.