

Séminaire
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salle L. Lliboutry, LGGE

North Atlantic Ocean air-sea interaction on different time scales

Sergey Gulev

(P.P. Shirshov Institute of Oceanology, Moscow)

We analyse the concept of Bjerknes implying a different character of air-sea interaction in the North Atlantic mid latitudes with atmosphere driving directly most short-term – interannual – sea surface temperature (SST) variability and the ocean contributing significantly to long-term – multidecadal – SST. The major focus is on longer (multidecadal) time scales associated with the Atlantic Multidecadal Variability (AMV). To prove the concept we performed the reconstruction of 130-yr long time series of surface fluxes in the North Atlantic mid latitudes using Voluntary Observing Ship (VOS) data and analysed the resulting time series of fluxes in conjunction with SST. The analysis shows that at long multidecadal time scales flux variations are forced by sea surface temperature (SST), contrasting the conventional picture at interannual timescales where surface fluxes drive SST. Thus, for the first time, the atmosphere response to multidecadal ocean signals is directly considered in terms of ocean-atmosphere heat exchange. This adds a new dimension to the role of mid-latitude North Atlantic SST in forcing North American and European climate. In the context of climate predictability our results imply that mid-latitude climate impacts over the surrounding land areas may be more predictable than previously thought. Also we will discuss in a broader context different time scales on which the ocean might force the atmosphere, in particular also on mesoscale and some very long scales. Some questions will be posed on a proper way to set numerical experimentation to investigate the nature of these interactions.