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Using relaxation experiments to determine remote influences useful for seasonal prediction over Europe

Richard Greatbatch (1), Gereon Gollan (1), Felicitas Hansen (1), Ole Wulff (2), Daniela Domeisen (2), and Thomas Jung (3)

(1) GEOMAR Helmholtz Centre for Ocean Research Kiel, Ocean Circulation and Climate Dynamics, Kiel, Germany (rgreatbatch@geomar.de), (2) ETH, Zürich, Switzerland, (3) Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany

Experiments using atmosphere-only, as well as coupled forecast models, in which parts of the model atmosphere are constrained towards reanalysis products by relaxation are described. Such experiments have proved useful for determining remote influences, e.g. from the tropics or from the stratosphere, potentially useful for seasonal forecasting boreal winter over Europe. Such techniques can also be used for diagnosing remote influences important in the dynamics of a particular season, a good example being the extreme winter of 1962/63. An example is also given for the boreal summer East Atlantic pattern in which relaxation experiments fail to capture the appropriate influence from the tropics. Possible reasons for this will be given.