Geophysical Research Abstracts
Vol. 14, EGU2012-3076-1, 2012
EGU General Assembly 2012


# Interaction between the Pacific and Atlantic storm tracks and its implication on the North Atlantic Oscillation.

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In this study, the connection between the Pacific and Atlantic storm tracks is investigated to better understand the influence of the Pacific flow on the North Atlantic Oscillation (NAO). The type of wave breaking in the North Atlantic area and the phase of the NAO have been shown to depend on the properties of the Pacific atmospheric flow (Franzke et al. 2004; Rivière and Orlanski 2007), but the key ingredients in the Pacific flow that influence the NAO are not well identified. The purpose of this study is to analyse the influence of the Pacific flow on the NAO by performing numerical experiments with the Marshall and Molteni (1993) three-level quasi-geostrophic model and by comparing our results with ECMWF data reanalysis.

The NAO, defined by the first EOF of the geopotential height in the North Atlantic area, is well reproduced by long term simulations of the model forced by ERA40 data. Similar properties appear in the observed NAO and simulated NAO, in particular, the nature of the waves breaking (more anticyclonic during positive phase events and more cyclonic during negative phase events), their spatial scale (large-scale waves dominate during positive phase events and small-scale waves dominate during negative phase events) and the presence of a large-scale ridge in the eastern Pacific that reaches its maximum four days before the maximum of the positive phase events. In order to investigate the influence of this ridge onto the NAO, diagnostic tools (such as the refractive index) are first used. Then, different strategies of sensitivity numerical experiments (such as initial-value problems) are considered to confirm the role played by the Pacific ridge.