



## **The Lifecycle of Storm Tracks**

Lenka Novak (1), Maarten H.P. Ambaum (2), and Remi Tailleux (3)

(1) United Kingdom (l.novakova@reading.ac.uk), (2) United Kingdom, (3) United Kingdom

Local quasi-periodic behaviour of storm tracks is found in the North Atlantic, the North Pacific, and in an aqua-planet global circulation model. Such quasi-periodicity is suggested to be a result of baroclinic instability that is characterised by nonlinear interactions between eddy fluxes and the mean-flow structure. This quasi-periodicity is associated with different processes at the beginning and end parts of the storm track. The beginning part exhibits maxima in both storm track activity and its growth rate, both of which oscillate temporarily in intensity akin to a predator-prey relationship. Towards the end of the storm track, the dynamics are characterised more by variability in eddy momentum fluxes and transient jets, the latter often exhibiting quasi-periodic latitudinal fluctuations. It is suggested that the above effect of cycling baroclinicity and heat flux induces changes in eddy anisotropy which are responsible for the periodic jet deflections further downstream. On average, low heat flux is associated with an equatorward deflection of the jet, and vice versa. This jet deflecting effect is characterised by a transfer of the system to a lower-frequency variability, and a mechanism to explain the observed preferred transitions of the North Atlantic jet is proposed. The oscillations in the storm track activity, baroclinicity and eddy-driven jet are closely linked, and can be viewed as describing the spatio-temporal lifecycle of the storm track.