



## **A regime analysis of the North Atlantic eddy-driven jet stream following sudden stratospheric warmings**

Gibbon Masukwedza (1,2) and Amanda Maycock (1)

(1) University of Leeds, School of Earth and Environment, Leeds, United Kingdom (a.c.maycock@leeds.ac.uk), (2) Zimbabwe Meteorological Services Department, Zimbabwe

The North Atlantic eddy-driven jet stream (NAJ) in winter has been shown to exhibit three preferred latitudinal positions [1]. Here we consider, for the first time, the influence of major Sudden Stratospheric Warmings (SSWs) on the regime behaviour of the NAJ. We use cluster analysis to investigate NAJ regime behaviour in a large ensemble of climate model experiments with stratospheric conditions nudged towards a major SSW, but with each ensemble member having freely evolving tropospheric conditions [2]. This experiment is compared to a control case in which stratospheric variability is absent. The experiments show that the SSW leads to an increased occupancy of the southerly NAJ state and reduced occupancy of the northerly state. This effect is distinct from the mean southward shift of the NAJ identified in many previous studies, and instead represents changes in the characteristics of NAJ variability about its mean position as a result of SSWs. These results may aid in understanding the mechanisms by which SSWs impact on the North Atlantic circulation and European climate.

### References

- [1] Woollings, T. J., Hannachi, A., Hoskins, B., 2010, Variability of the North Atlantic eddy-driven jet stream, doi: 10.1002/qj.625
- [2] Hitchcock, P., Simpson, I. R., 2014, The Downward Influence of Sudden Stratospheric Warmings, doi: 10.1175/JAS-D-14-0012.1