

# The MJO and its Teleconnections

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The MJO is the leading mode of tropospheric instability in the tropics and affects weather systems around the globe. This study focusses on these so called teleconnection patterns and how they may change in a warming global climate.

## Methodology

- **Diagnostics** have been created for the MJO and for four key extratropical patterns – the North Atlantic Oscillation system (NAO), the Pacific North American pattern (PNA), the Arctic Oscillation (AO) and the Antarctic Oscillation (AAO).
- Using these diagnostics **time series** of ‘active’ days are created for each regime, which are then **compared** against each other.
- **Hypothesis tests** are used to assess whether certain regimes are more likely to occur within a given time frame of each MJO phase, indicating **forcing**.
- This is repeated for a number of climate models (**CMIP6**) and compared against **reanalysis** data.
- The same analysis is then used to find the forcing in **future climate simulations** with the effects of **climate change** then assessed.

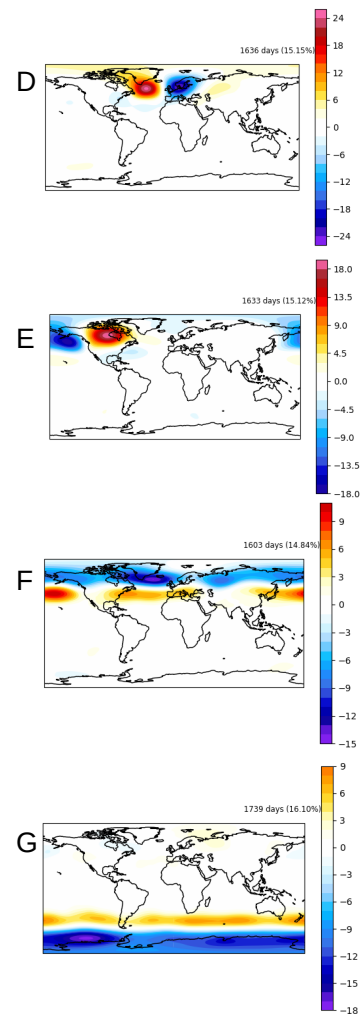
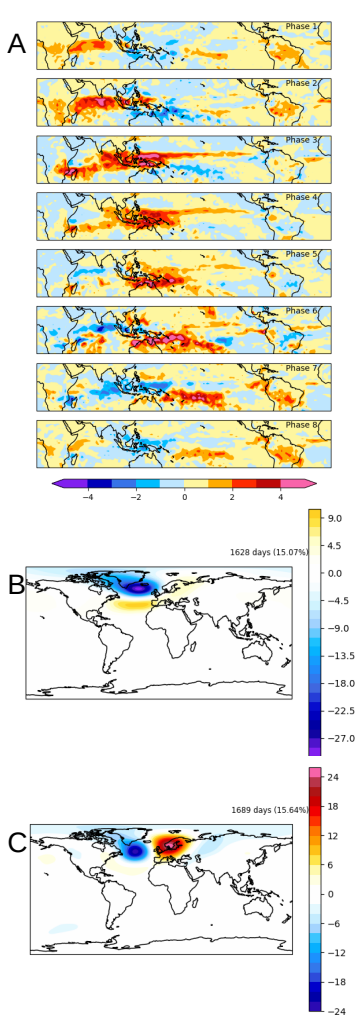
Over the coming months this methodology will be implemented and the results will be presented. If the analysis goes well, it will be extended to study the IOD and CCKWs.

## Figures

A – Winter composites of precipitation anomaly ( $\text{kg m}^{-2} \text{s}^{-1}$ ) in the tropics at each of the eight MJO phases.

B-G – Yearly composites of 500hPa geopotential height anomaly (m) for the ‘active’ or ‘positive’ phases of the NAO, Scandinavian Blocking, Atlantic ridge, PNA, AO and AAO regimes respectively.

All data taken from the period 1985-2014 in the Met Office HadGEM3-GC31-MM model historical simulation



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