Department of Meteorology

# LUNCHTIME SEMINARS

University of Reading

School of Mathematical, Physical and Computational Sciences

*The next lunchtime seminar will be given by*

## Elena Saggioro

# Probabilistic causal network modelling of southern hemisphere jet sub-seasonal to seasonal predictability

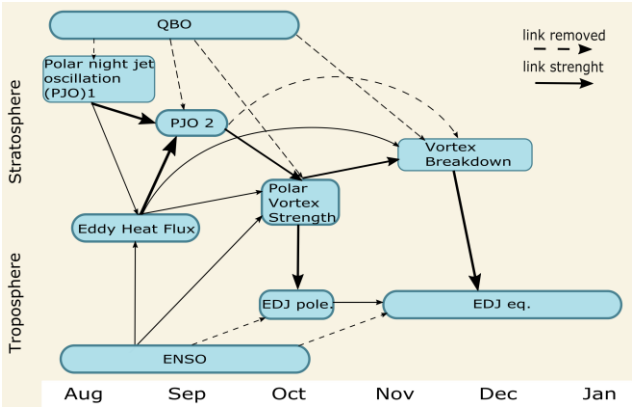


*Fig. Network structure representing the causal drivers leading to S2S jet variability, for both its late spring poleward (EDJ pole.) and early summer equatorward (EDJ eq.) shifts. Links are detected from seasonal hindcast data. Dashed links are the ones removed via a conditional independence test with 0.05 significance level and the width of the link indicates the strength of the connection.*


Predictions of the Southern Hemisphere mid-latitude jet stream are crucial for skilful forecasts of the austral mid-to-high latitudes. Several oceanic and atmospheric phenomena could, if better represented in models, improve springtime jet predictions on sub-seasonal to seasonal (S2S) timescales. However, no studies have quantified their combined potential skill. This study addressed this gap by using a novel, knowledge-driven probabilistic causal network approach. This statistical model represents the connections between known drivers and the jet with conditional probabilities, trained on large sets of model data. Our analysis confirms the stratospheric polar vortex (SPV) as crucial predictor of jet variability. However, the vortex itself is hard to predict on S2S timescales due to sub-monthly internal stratospheric variability, creating a predictability bottle-neck for the jet.


**Tuesday 26th September, 13:00–13:50 in GU01**

and on Teams > Meteorology All > Internal (Tuesday) Seminar Series