START

+ Warm Water Transport

+ Oceanic Heat Content

A

+ Surface Latent Heat Flux

Negative Potential Vorticty

B

Warm Converyor Belt Transport

Atmospheric Block

C

EXTREME TEMPER-ATURES

Cold Air Outbreak

+Surface Latent Heat Flux

- Oceanic Heat Content

~~Surface Latent Heat Flux~~

~~Negative Potential Vorticity~~

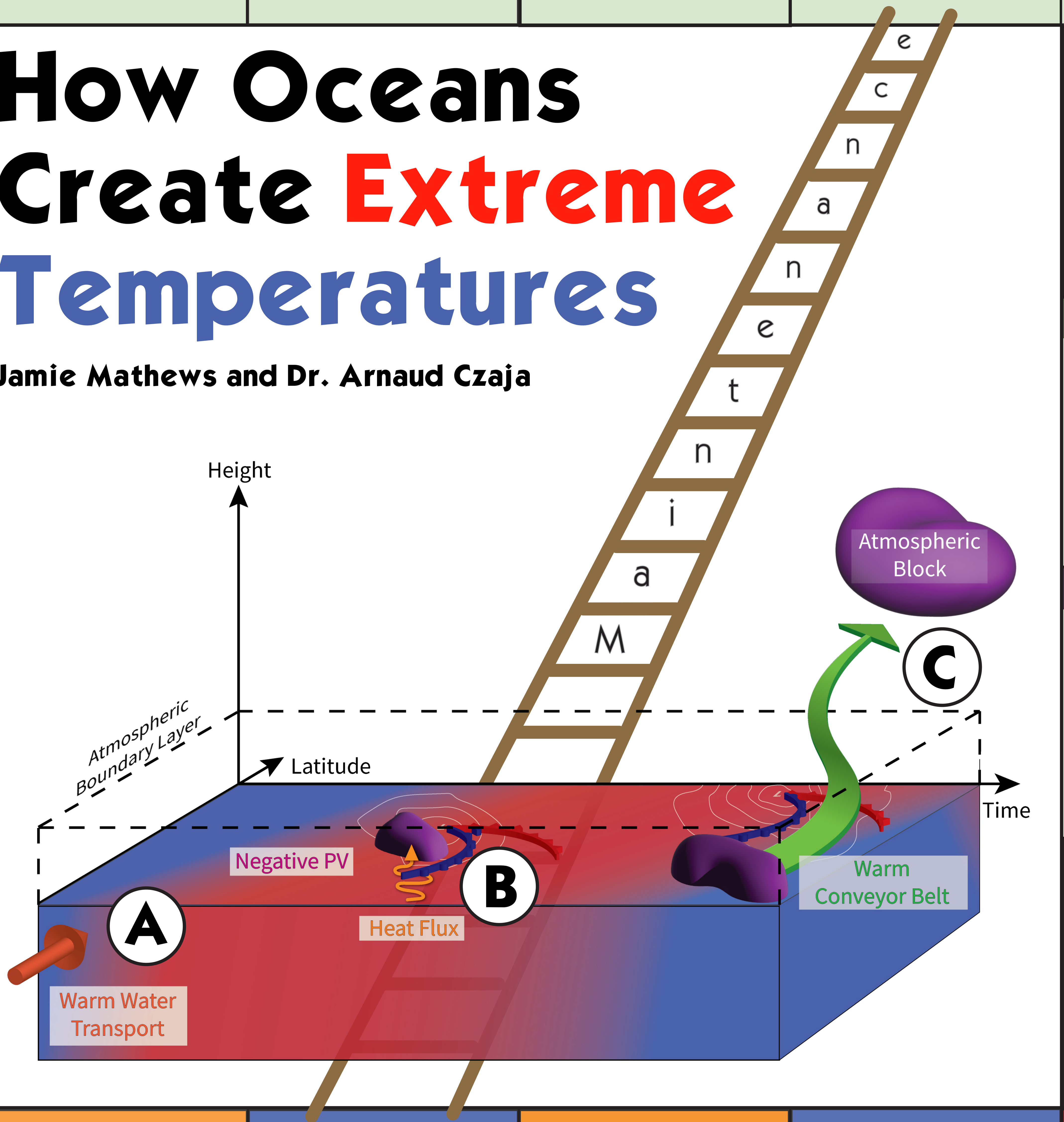
~~Warm Conveyor Belt Transport~~

~~Atmospheric Block~~

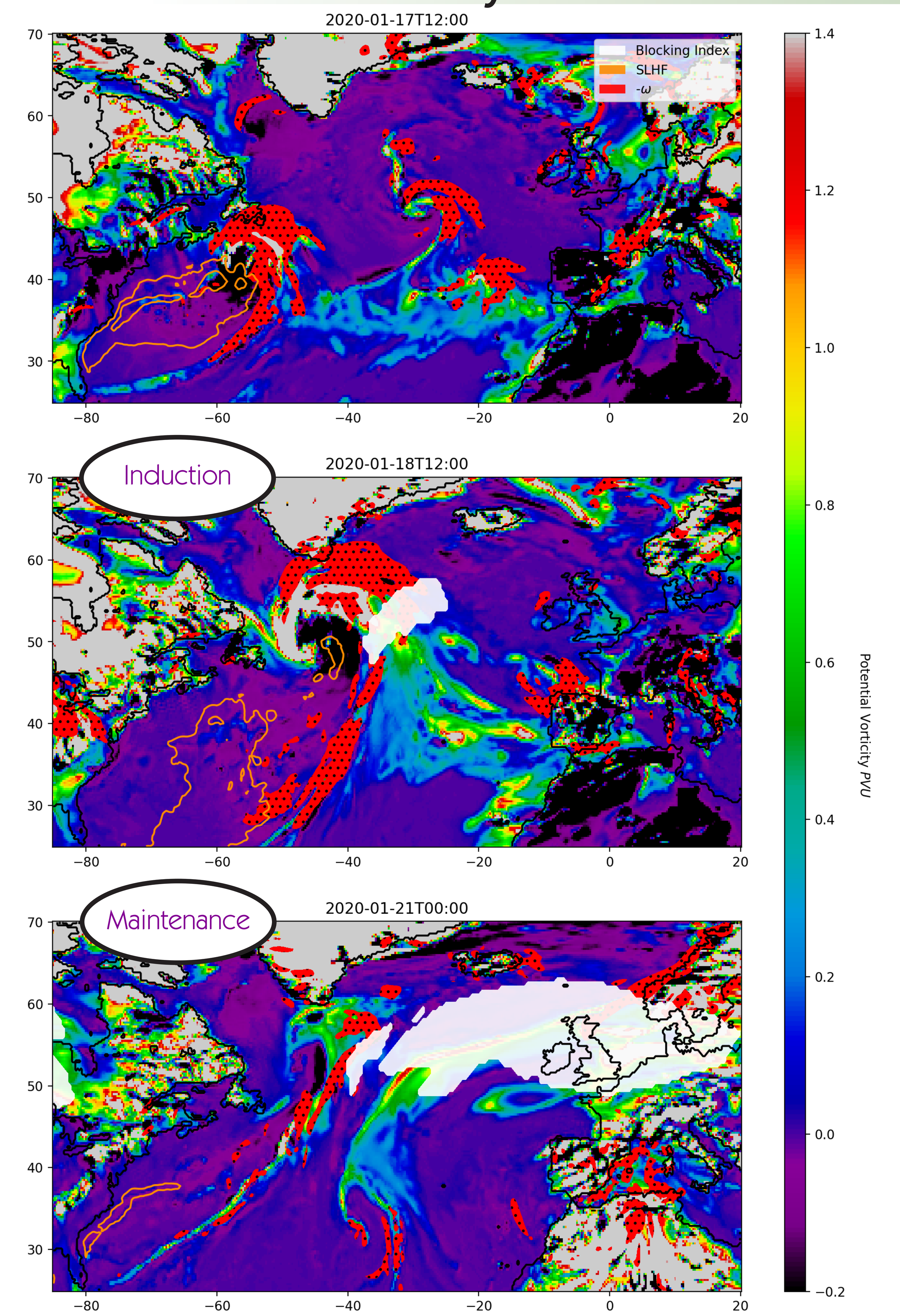
END

How Oceans Create Extreme Temperatures

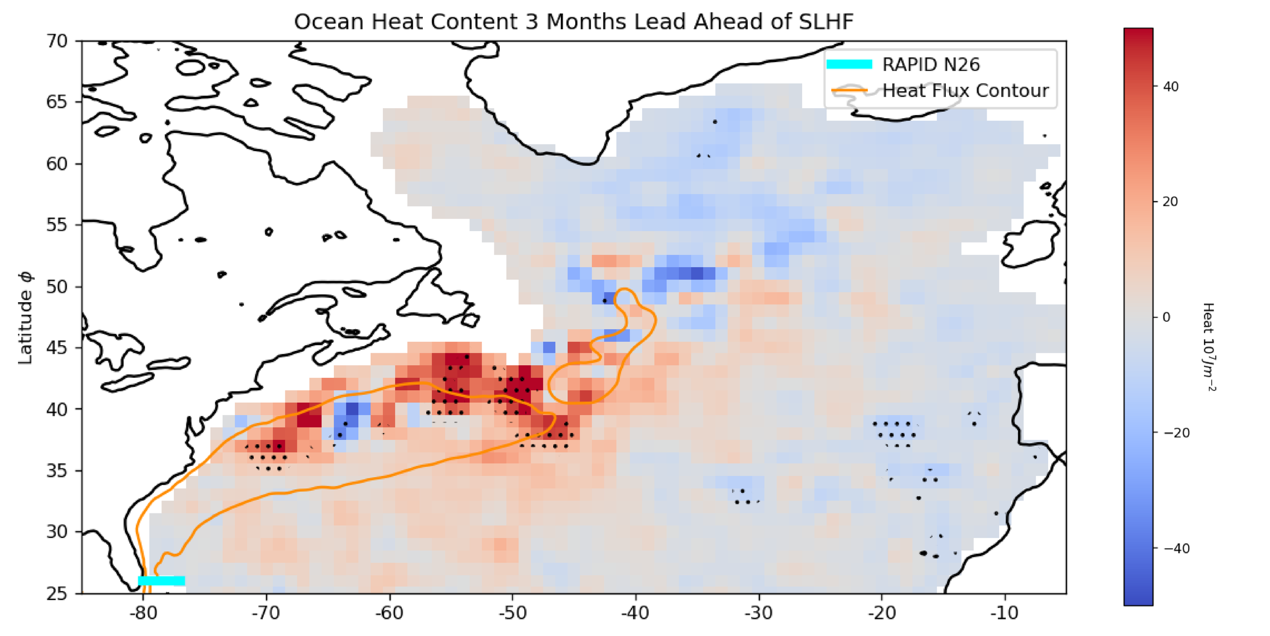
Jamie Mathews and Dr. Arnaud Czaja



Case Study



Oceanic Maintenence



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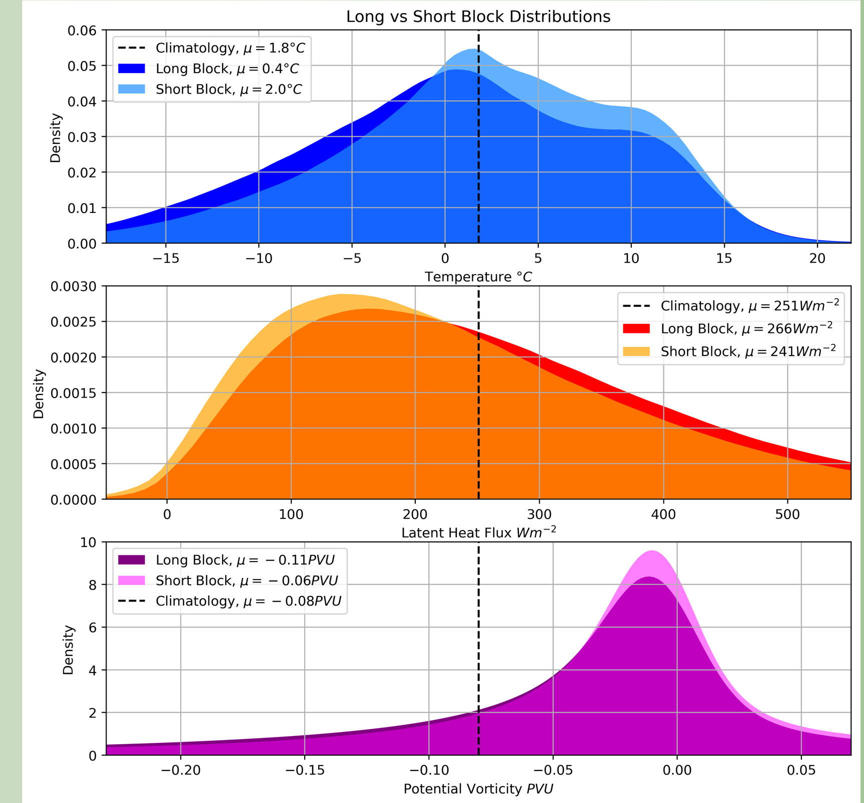
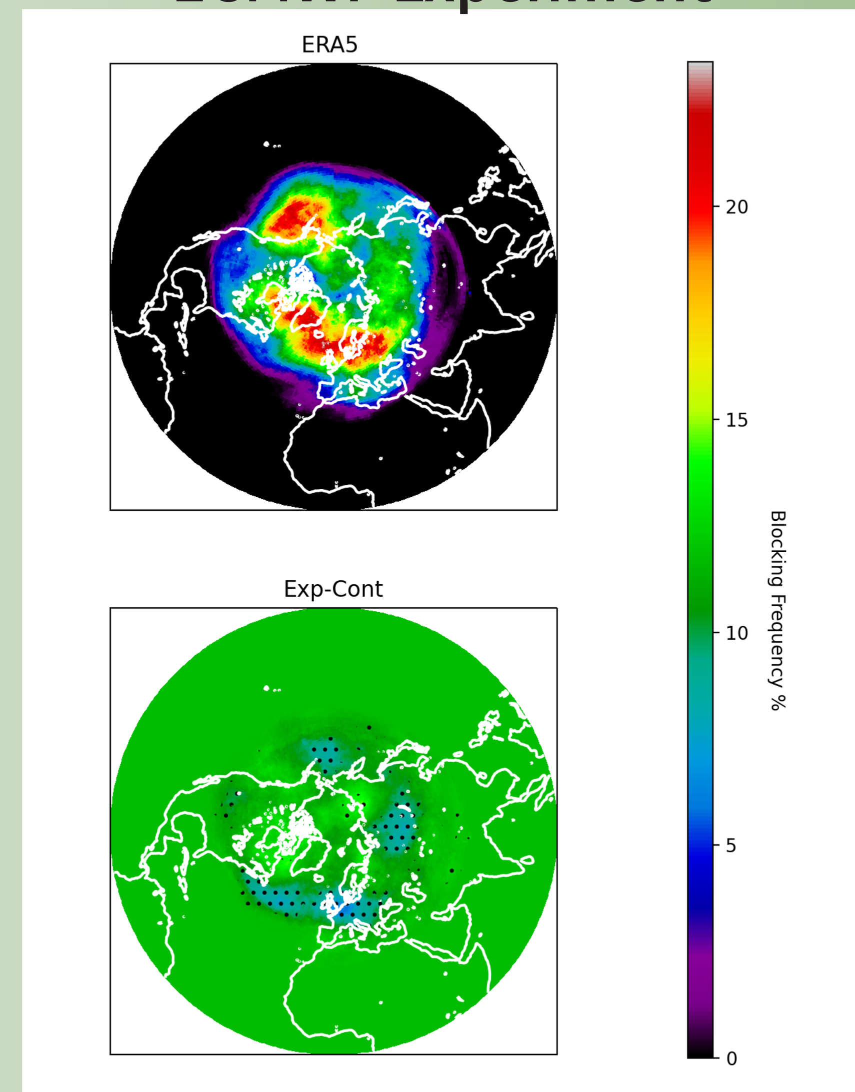


ECMWF Experiment



Orders of Magnitude

- O(1PVU) generated in the atmospheric boundary layer
- O(1PVU) transported to block

$$\Delta Q_{BL} = -2f\frac{\Delta t_A}{\Delta t_O}\frac{\Delta HC}{C_A(\rho_{BL}h_{BL})^2}$$

$$\Delta Q_{Block} = \frac{2fg\Delta\theta_O}{\Delta P_{Block}}\frac{\Delta t_A}{\Delta t_O}\frac{C_O\rho_O h_{ML}}{C_A\rho_{BL}h_{BL}}$$

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