



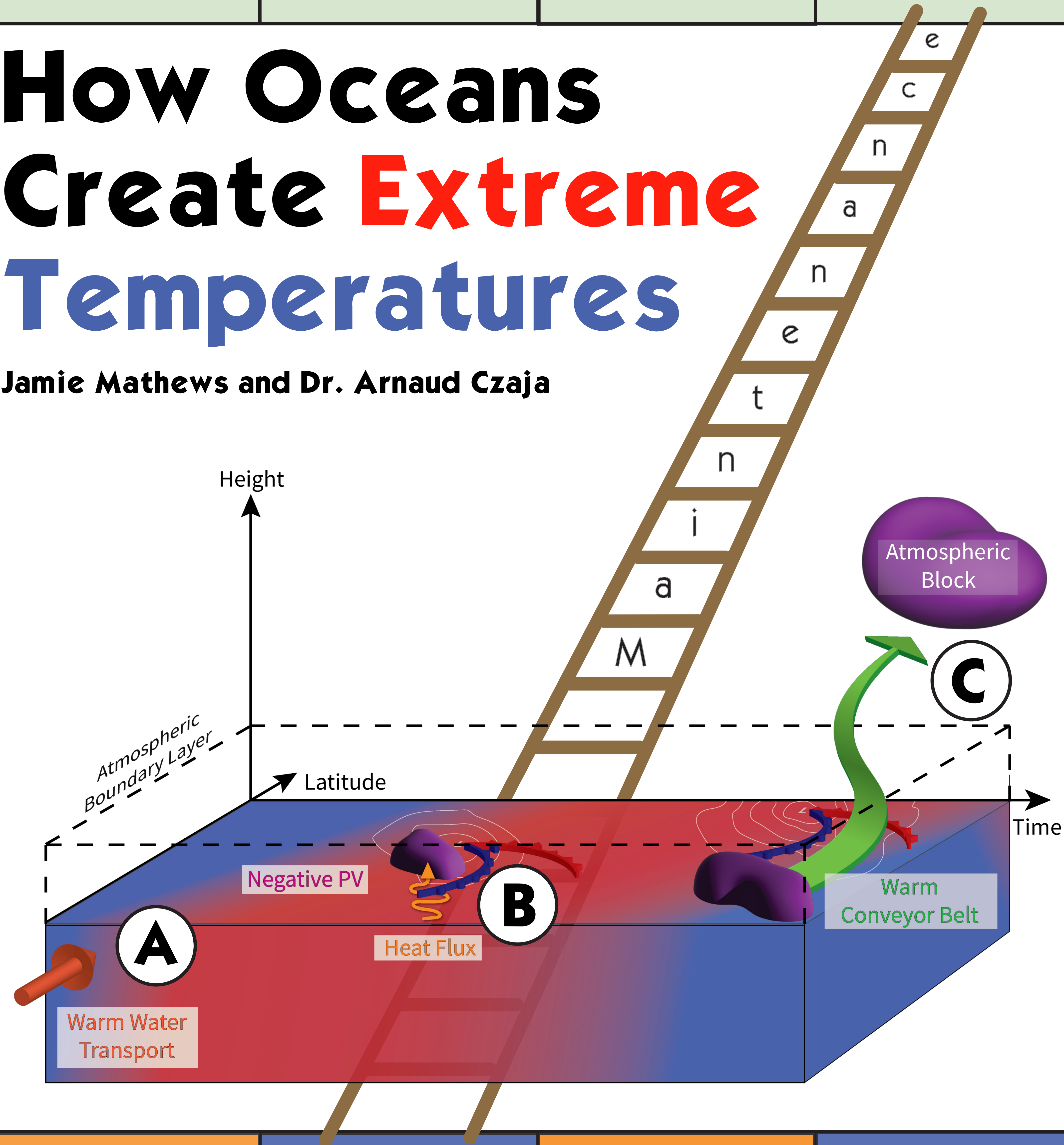
Negative
Potential
Vorticity

~~Atmospheric Block~~

~~Warm
Conveyor
Belt
Transport~~

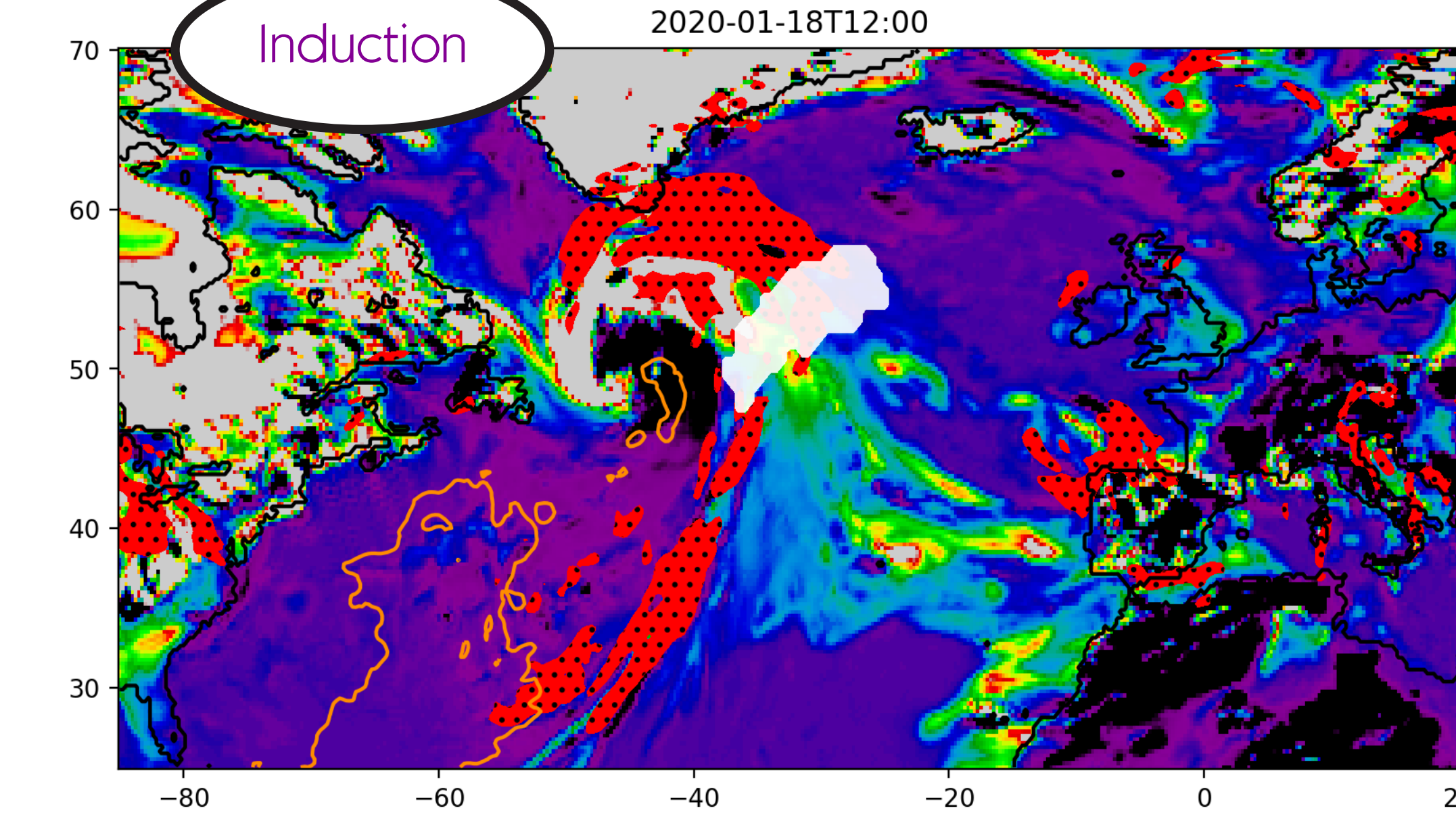
~~Negative Potential Vorticity~~

Jamie Mathews and Dr. Arnaud Czaja

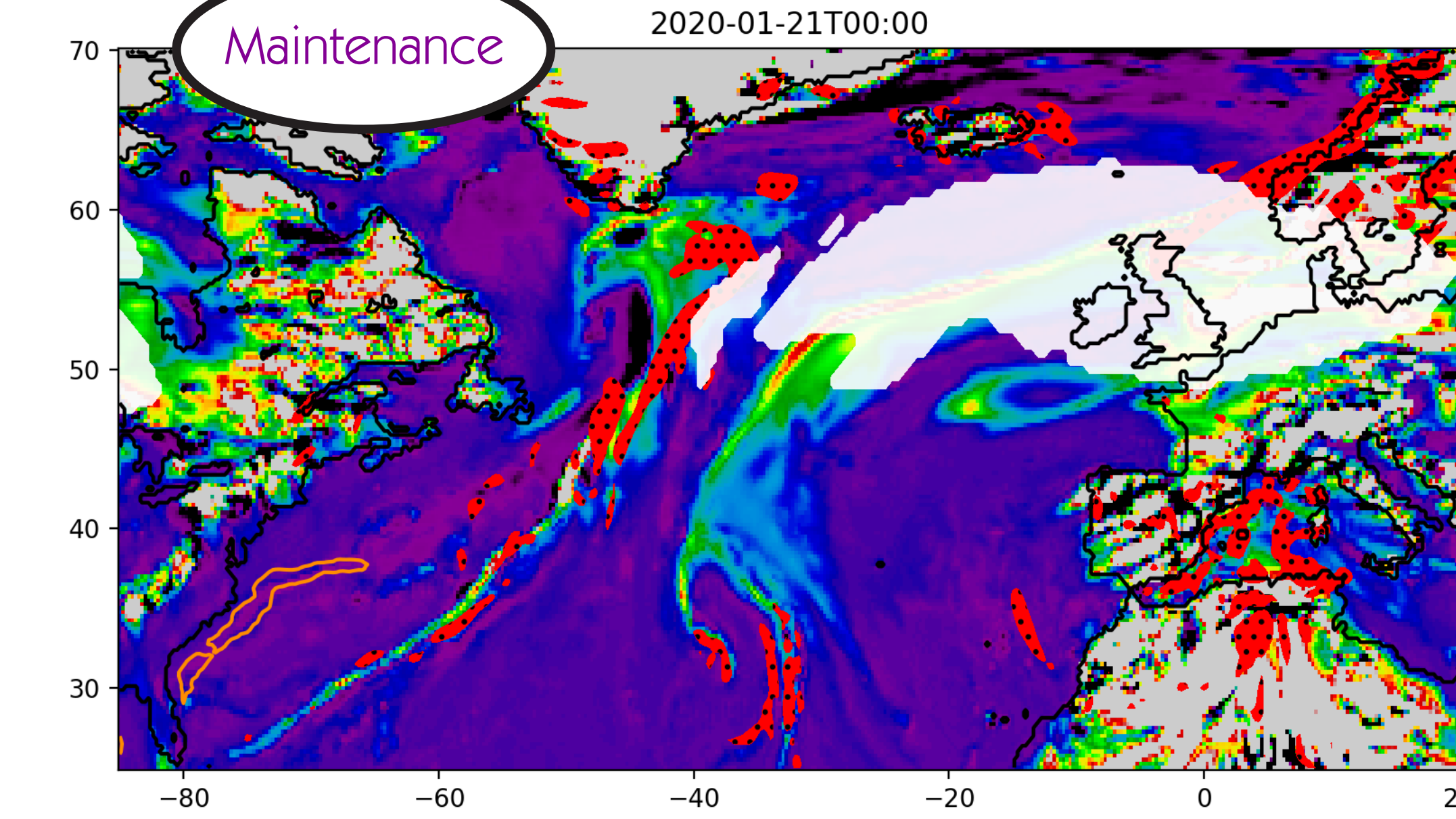


EXTREME TEMPER- ATURES

Induction



Maintenance



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

This presentation participates in **OSPP**



Outstanding Student & PhD
candidate Presentation contest



Figure 10 consists of three vertically stacked plots showing density distributions for different variables. The top plot, titled "Long vs Short Block Distributions", shows the density of Temperature (°C) for three cases: Climatology ($\mu = 1.8^{\circ}\text{C}$, dashed black line), Long Block ($\mu = 0.4^{\circ}\text{C}$, solid blue line), and Short Block ($\mu = 2.6^{\circ}\text{C}$, light blue shaded area). The x-axis ranges from -15 to 20, and the y-axis (Density) ranges from 0.00 to 0.06. A vertical dashed line is at $\mu = 1.8^{\circ}\text{C}$. The middle plot shows the density of Latent Heat Flux (Wm^{-2}) for Long Block (red solid line, $\mu = 251\text{Wm}^{-2}$) and Short Block (orange solid line, $\mu = 241\text{Wm}^{-2}$) distributions, compared to the climatological distribution (dashed black line, $\mu = 266\text{Wm}^{-2}$). The x-axis ranges from 0 to 500, and the y-axis (Density) ranges from 0.0000 to 0.0030. A vertical dashed line is at $\mu = 266\text{Wm}^{-2}$. The bottom plot shows the density of Potential Vorticity (PVU) for Long Block (purple solid line, $\mu = -0.11\text{PVU}$) and Short Block (pink solid line, $\mu = -0.06\text{PVU}$) distributions, compared to the climatological distribution (dashed black line, $\mu = -0.09\text{PVU}$). The x-axis ranges from -0.20 to 0.05, and the y-axis (Density) ranges from 0 to 10. A vertical dashed line is at $\mu = -0.09\text{PVU}$.

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

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