

Supplemental Information

**Responses of westerly jet over Asia versus North America in Last Glacial
Maximum and their attributions**

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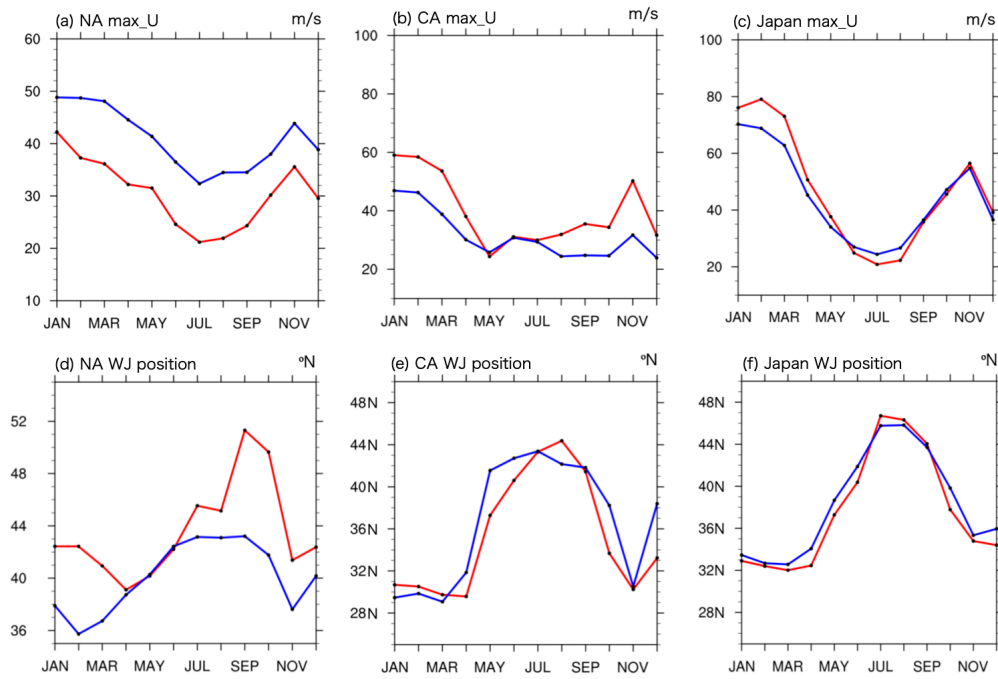
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Supplemental Table 1. Summary of boundary conditions for the PI control experiment and six sensitivity experiments.

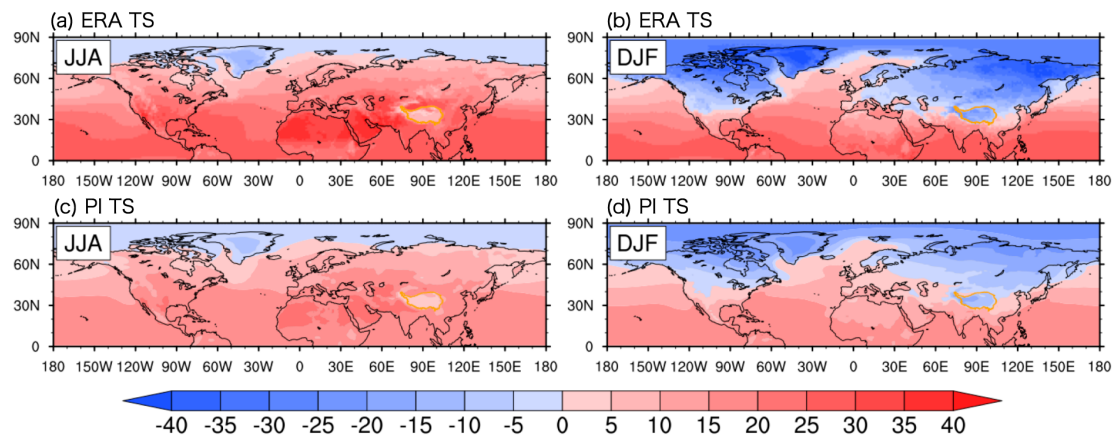
	PI	LGM	IS_albedo	IS_topo	GHG	ORB	LSC
Ice sheet Surface	PI	LGM	PI	LGM	LGM	LGM	PI
Ice sheet Height	PI	LGM	LGM	PI	LGM	LGM	PI
Greenhouse Gases	PI	LGM	LGM	LGM	PI	LGM	PI
Orbital Parameters	PI	LGM	LGM	LGM	LGM	PI	PI
Land-sea Configuration	PI	LGM	LGM	LGM	LGM	LGM	LGM

Supplemental Figure 1: Monthly changes in WJ intensity and WJ position.



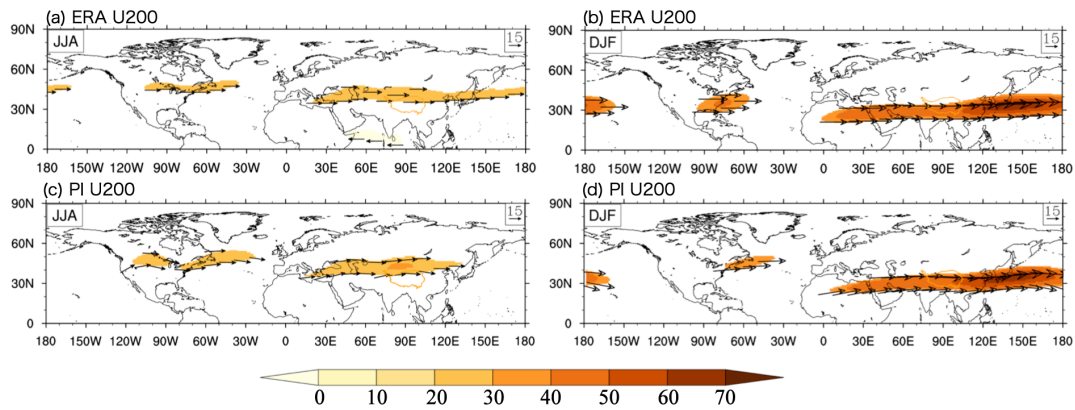
Monthly differences of **a-c** 200-hPa maximum zonal velocity (m s^{-1}) and **d-f** the position of WJ over (left) North America (270° - 290°E), (middle) central Asia (70° - 90°E) and (right) Japan (125° - 145°E). The red line represents the PI experiment, and the blue line represents the LGM experiment.

Supplemental Figure 2: Model validation for surface temperature



Averaged surface temperature ($^{\circ}\text{C}$) over Northern Hemisphere in **a, b** ERA data and **c, d** the PI experiment in JJA (left) and DJF (right).

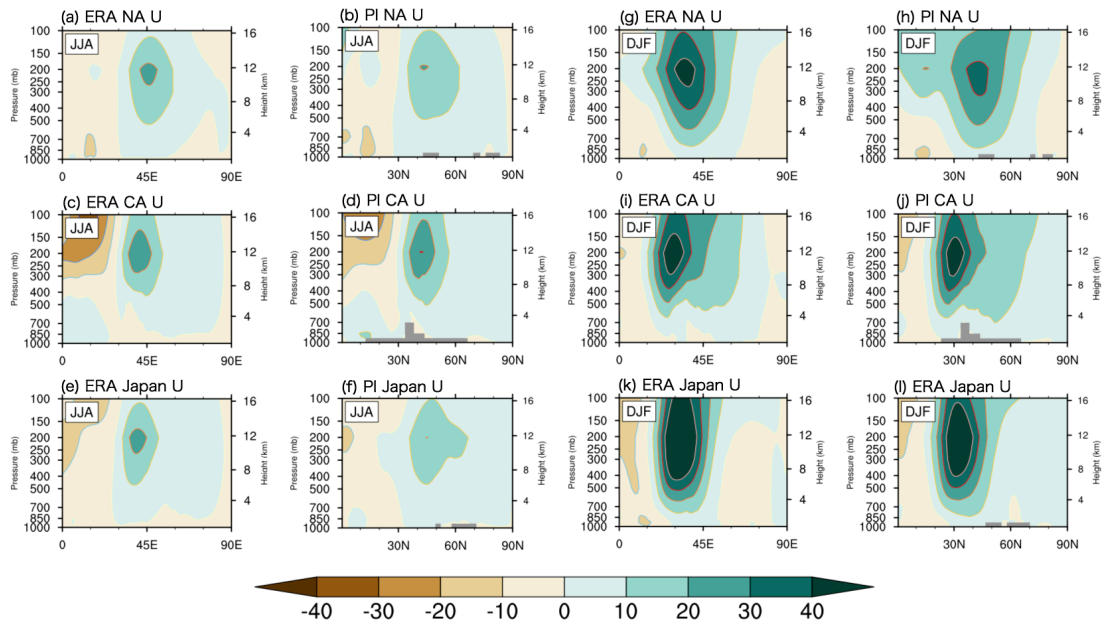
Supplemental Figure 3: Model validation for 200-hPa zonal wind fields



Northern Hemisphere 200-hPa zonal wind fields (vectors, m/s) and its magnitude (shaded, m/s) in **a, c** ERA data and **b, d** the PI experiment in JJA (left) and DJF (right).

The zonal winds with the velocity exceeding 20 m/s and 35 m/s are drawn in JJA and DJF, respectively.

Supplemental Figure 4: Model validation for vertical zonal wind fields



Vertical profile of the zonal wind fields (m/s) averaged for **a, b** North America (270°-290°E), **c, d** central Asia (70°-90°E), and **e, f** Japan (125°-145°E) in ERA (left) and the PI experiment (right) in JJA. **g-l** is similar with **a-f**, but for DJF. The gray shaded represents the topography.