Supplement of Atmos. Chem. Phys., 24, 2033–2043, 2024
https://doi.org/10.5194/acp-24-2033-2024-supplement


Atmospheric Chemistry and Physics
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EGU

*Supplement of*

# Moist bias in the Pacific upper troposphere and lower stratosphere (UTLS) in climate models affects regional circulation patterns

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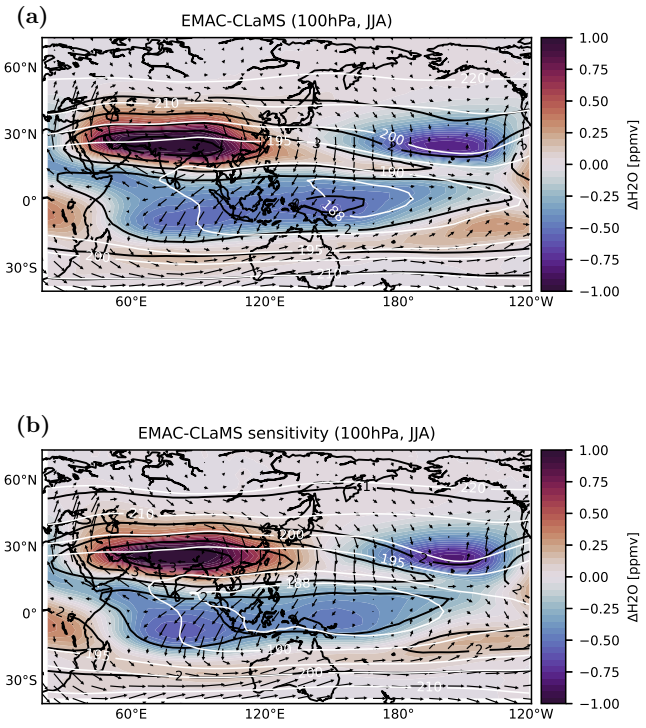


**Figure S1.** Water vapour zonal anomalies at 100 hPa for boreal summer (June–August) from (a) modified–Lagrangian EMAC–CLaMS and (b) Lagrangian EMAC–CLaMS sensitivity simulation without including the radiative and dynamical feedback of Lagrangian water vapour. Black contours show climatological water vapor mixing ratios, white contours temperature and black arrows the horizontal wind.

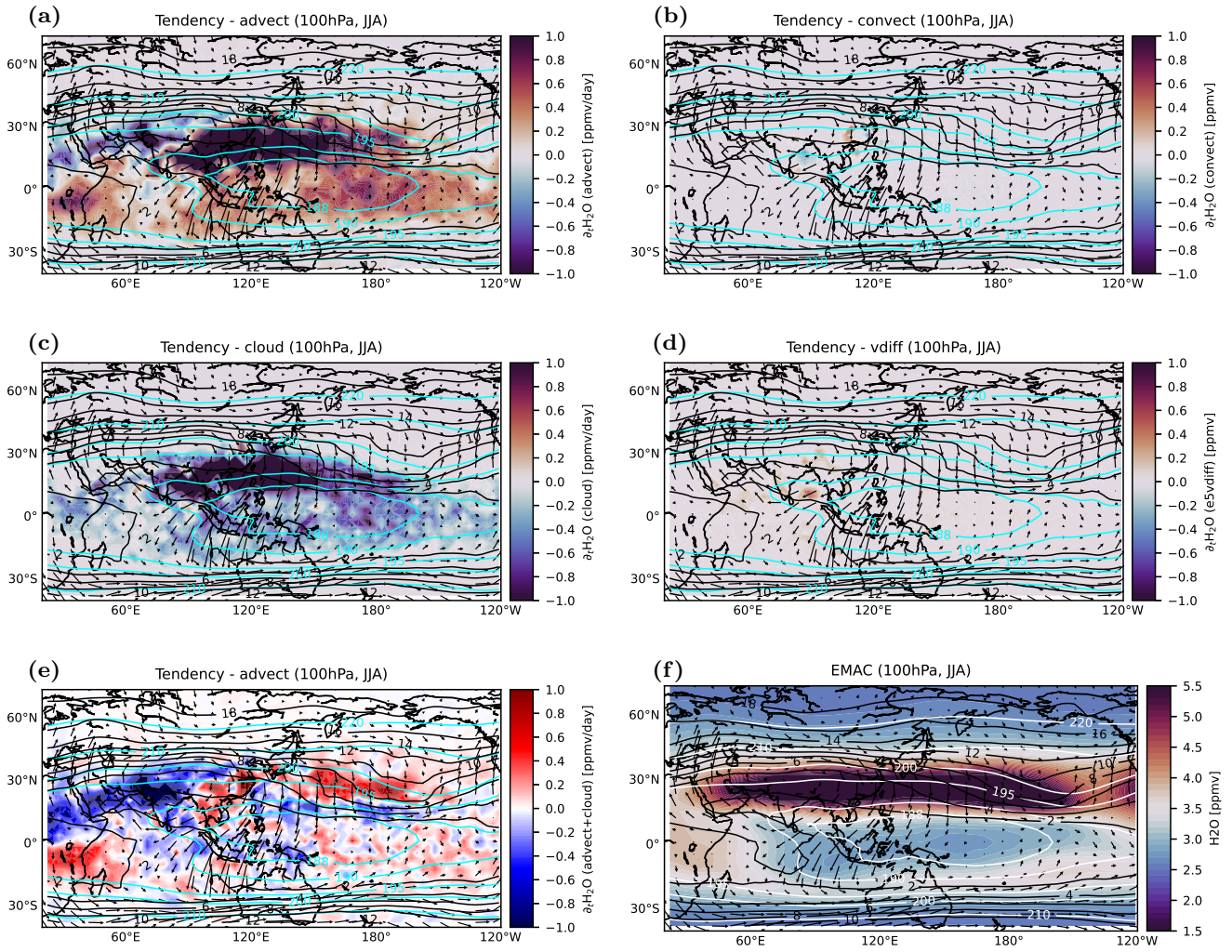


**Figure S2.** Distribution of water vapour tendencies at 100 hPa for boreal summer (June–August) from EMAC simulation. Shown are tendencies for (a) advection, (b) cloud processes, (c) the sum of advection and cloud processes, (d) convection, (e) vertical diffusion, and (f) shows the distribution of water vapour mixing ratios at this level. Black contours show PV, black arrows horizontal wind, cyan contours temperature (white contours in f).

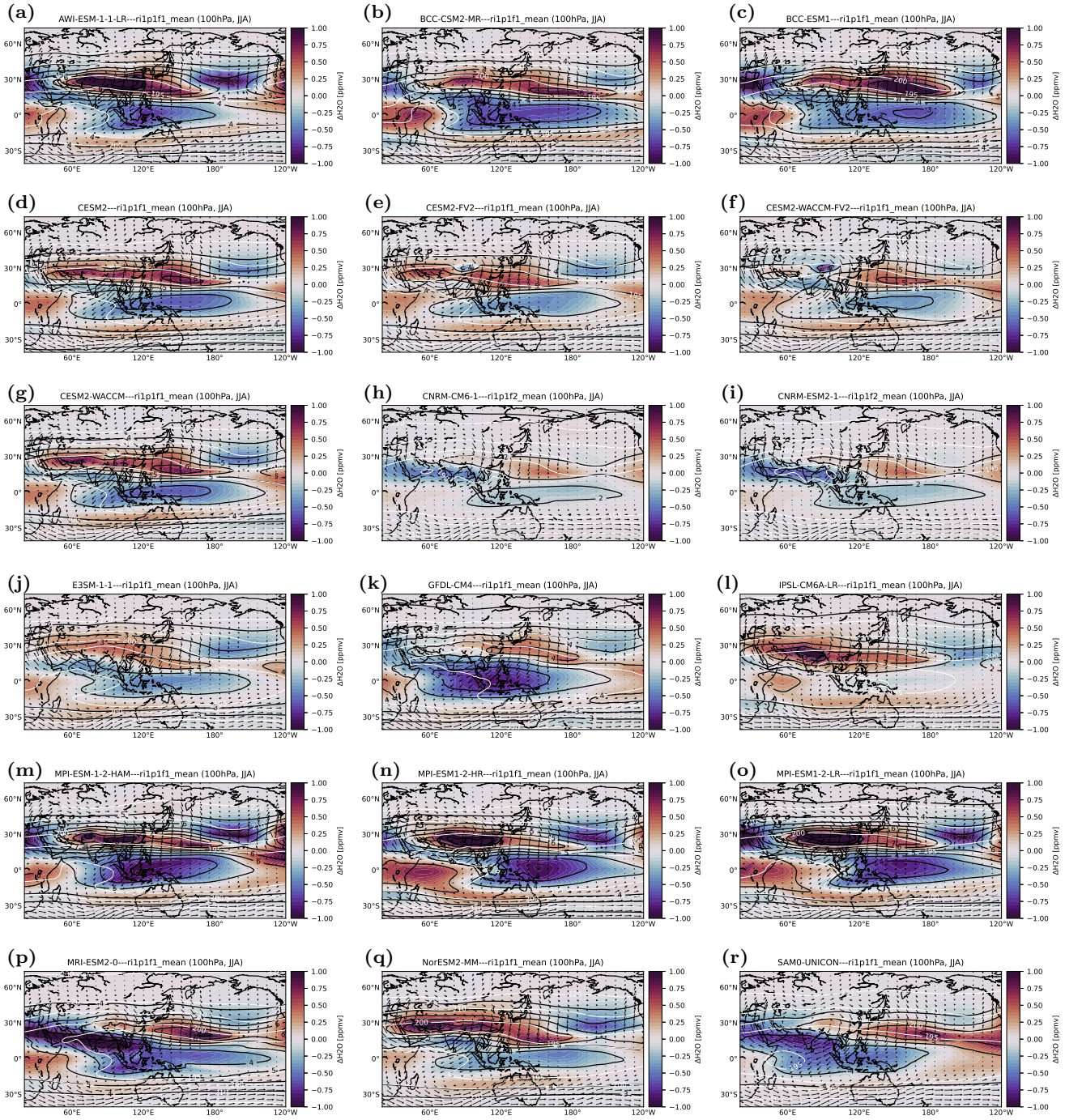


**Figure S3.** Water vapour zonal anomaly distribution at 100 hPa for boreal summer (June–August) from individual CMIP6 models. Black contours show climatological water vapor mixing ratios, white contours temperature and black arrows the horizontal wind.