

Kitoh, A., and H. Endo, 2025: The asymmetric response of the spring and autumn atmospheric circulation over East Asia to a warming climate. *J. Meteor. Soc. Japan*, **103**, <http://doi.org/10.2151/jmsj.2025-028>.

Plain Language Summary: We show how the atmospheric circulation evolves during the transition between the seasons. The timing of the sign-reversal of the land–sea sea-level pressure difference moves significantly later through the boreal autumn during the late 21st century, but that there is little difference in the sign-reversal during spring. This asymmetric seasonal response is associated with a greater land–sea difference in surface temperature increase and pressure drop in autumn than in spring.

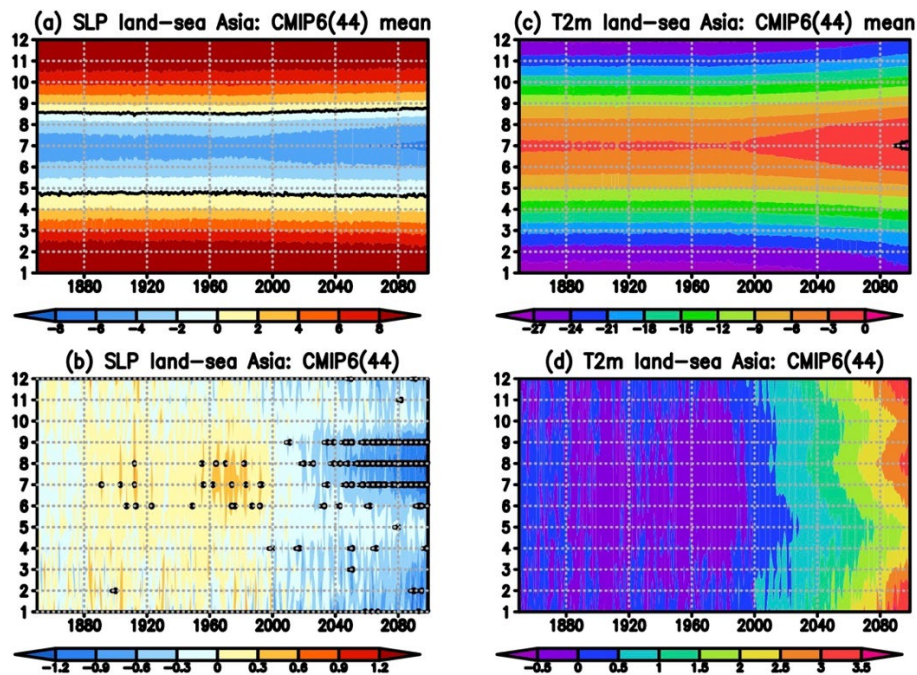


Figure 1. (a) Year–month distribution of the monthly mean sea-level pressure (SLP) differences (hPa) between land and sea from the 44 CMIP6 multi-model ensemble (MME) mean using the historical and SSP5-8.5 scenario experiments over the period 1850–2099. “Land” and “Sea” values are averaged over the regions 25°N–60°N, 30°E–180°E and 0°N–60°N, 45°E–180°E, respectively. (b) As for (a), but showing the deviation from the 1850–1899 average. (c) and (d) As for (a) and (b), but for the monthly mean surface air temperature (T2m) (°C). In (a) and (c), zero lines are black. In (b), black dots indicate that 75% of models have the same sign.

Highlights:

- We investigate future changes in the timing of the winter-to-summer and summer-to-winter transitions associated with the monsoon circulations projected by the 44 CMIP6 models.
- There is an asymmetry in the projected changes in the future, with smaller changes in spring and larger changes in autumn.
- This asymmetric seasonal response is associated with a greater land–sea difference in surface temperature increase and pressure drop in autumn than in spring.