Which regional cloud-radiative changes are most important for the global warming response of the midlatitude jet streams?

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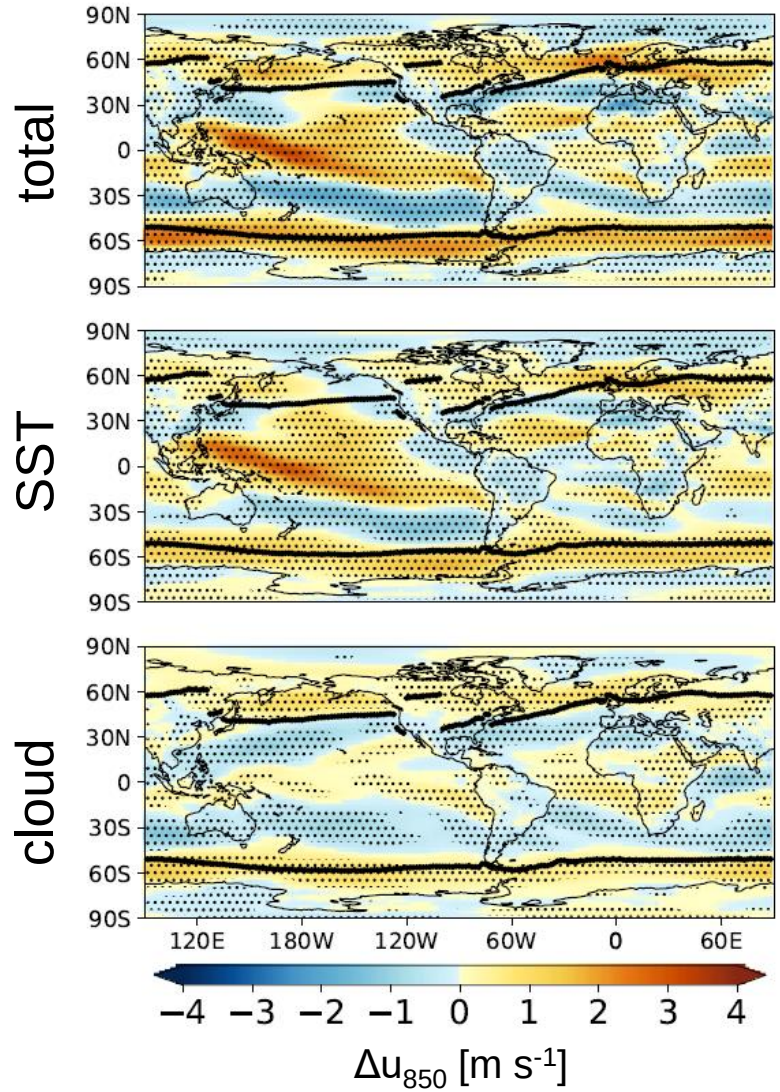
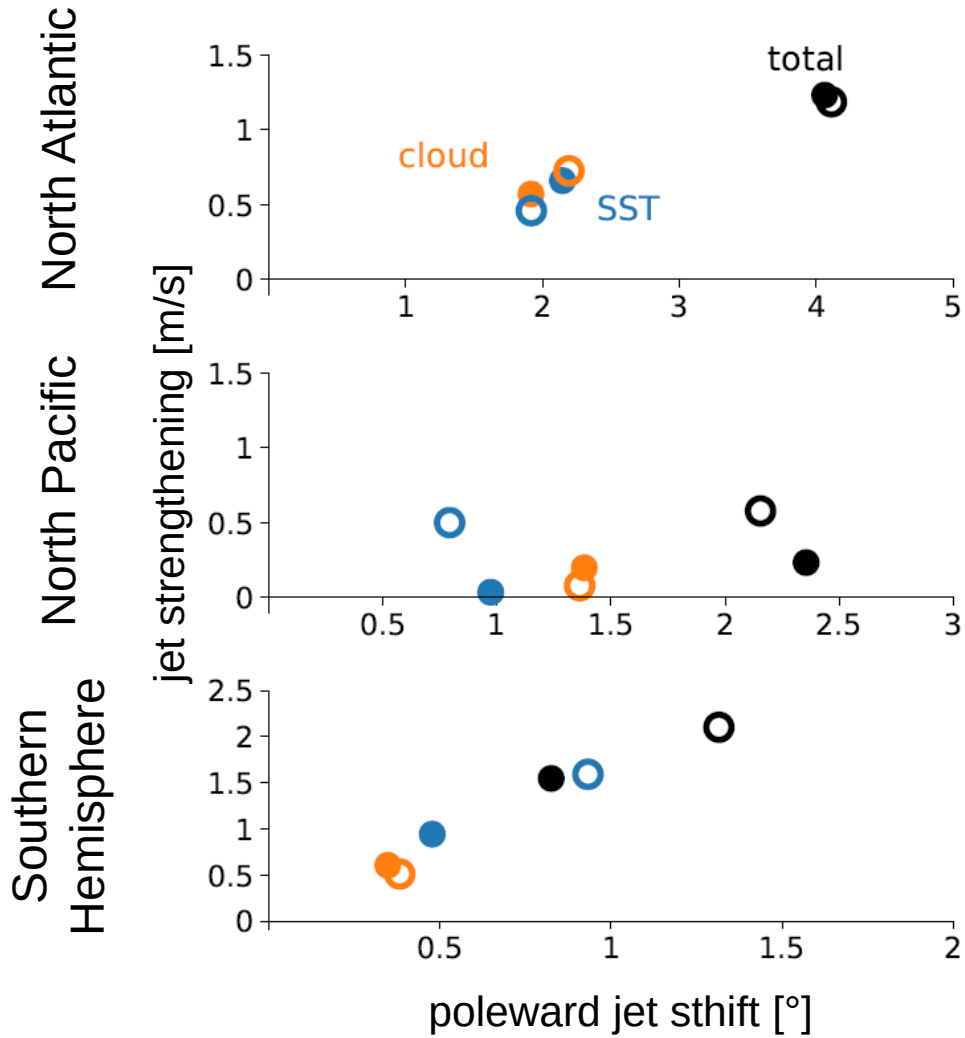
Annual-mean 850 hPa zonal wind response to uniform 4K SST increase in ICON



- About half of the zonal wind response can be attributed to cloud changes
- Cloud impact is zonally symmetric, consistent with a zonally symmetric change in cloud-radiative heating in the midlatitudes
- Cloud impact is dominated by tropical cloud changes (not shown)

Albern, N., A. Voigt and J. G. Pinto (2019). Cloud-radiative impact on the regional responses of the midlatitude jet streams and storm tracks to global warming. *J. Adv. Model. Earth Sy.*, *11,* 1940-1958.

Half of annual-mean jet response in NH attributed to clouds



- Cloud impact on jet response is substantial, and largely independent of season (not shown) and pattern of SST increase, but depends on the ocean basin
- Jet strengthening is dominated by tropical cloud changes (not shown)
- Tropical, midlatitude and polar cloud changes contribute to jet shift (not shown)

● uniform SST increase

○ pattern SST increase

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