

Rao, S., 2016: Sensitivity of the tropical easterly jet to the distribution and magnitude of latent heating in an aqua-planet model. *J. Meteor. Soc. Japan*, **94**, 371-388.

<https://doi.org/10.2151/jmsj.2016-020>

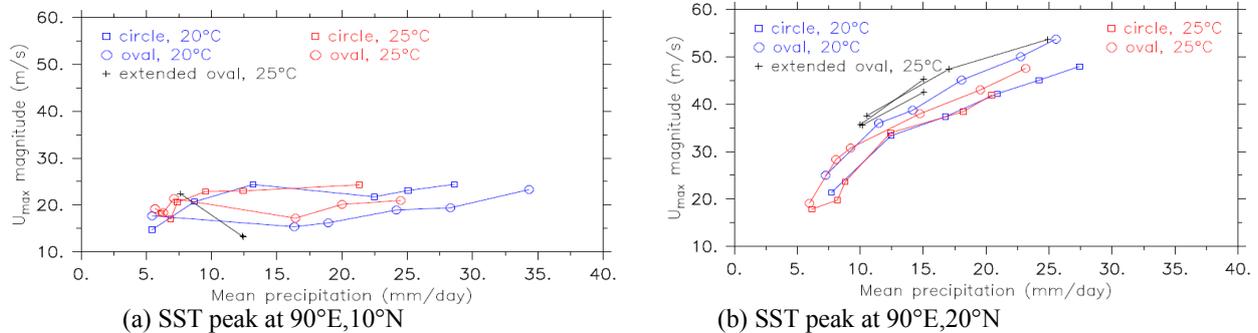


Fig 1: Aqua-planet simulations showing that only a single heat source at higher tropical latitudes is responsible for higher zonal wind speeds.

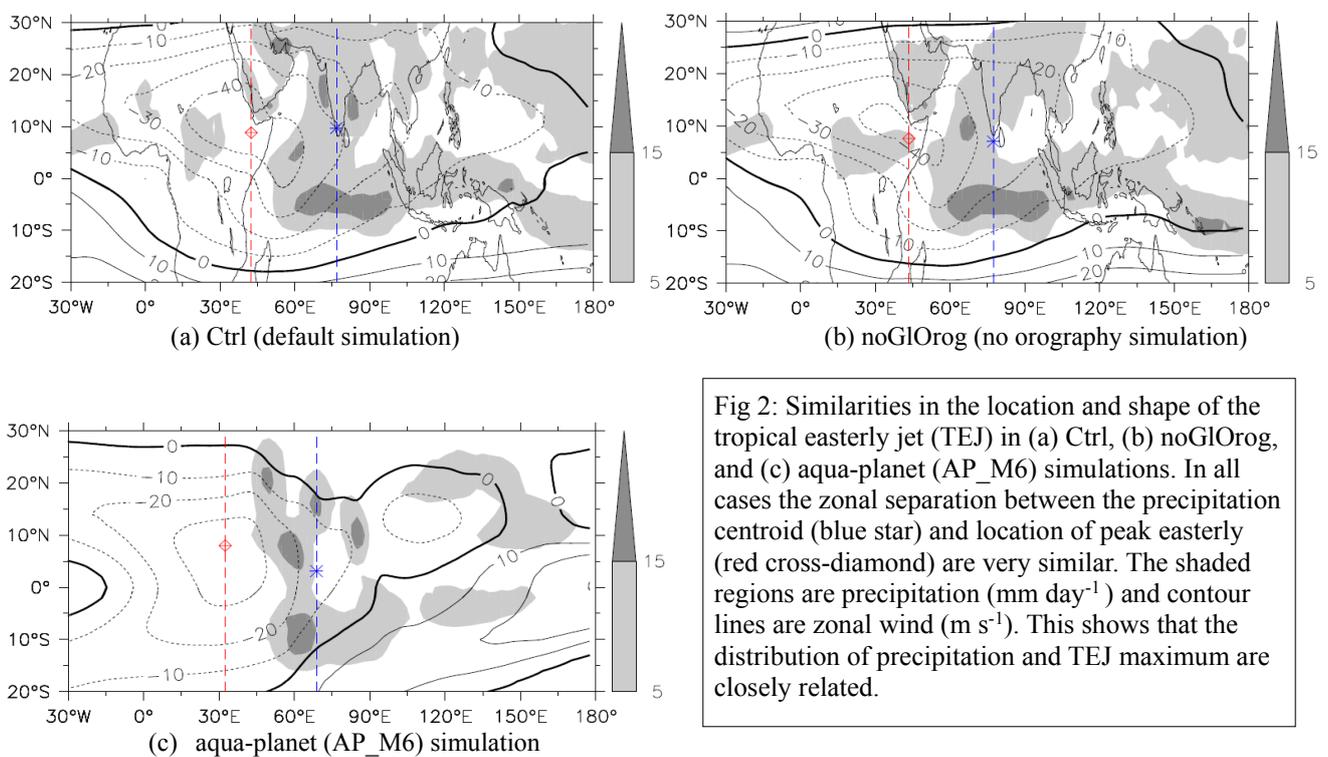


Fig 2: Similarities in the location and shape of the tropical easterly jet (TEJ) in (a) Ctrl, (b) noGIORog, and (c) aqua-planet (AP_M6) simulations. In all cases the zonal separation between the precipitation centroid (blue star) and location of peak easterly (red cross-diamond) are very similar. The shaded regions are precipitation (mm day^{-1}) and contour lines are zonal wind (m s^{-1}). This shows that the distribution of precipitation and TEJ maximum are closely related.

- A heat source at 20°N is more to be robust in generating zonal wind speeds comparable to that of the TEJ. But this heating cannot generate a true TEJ vertical structure. Equatorial heating is required to impart a realistic vertical baroclinic structure in the tropical longitudes where the TEJ is located. However it is insufficient in generating a true TEJ horizontal structure.
- Both equatorial and higher tropical heating is required for generating a true TEJ horizontal and vertical structure.
- If the precipitation patterns are similar then the TEJ is similar with or without land. Hence latent heat release is the dominant control on the TEJ.