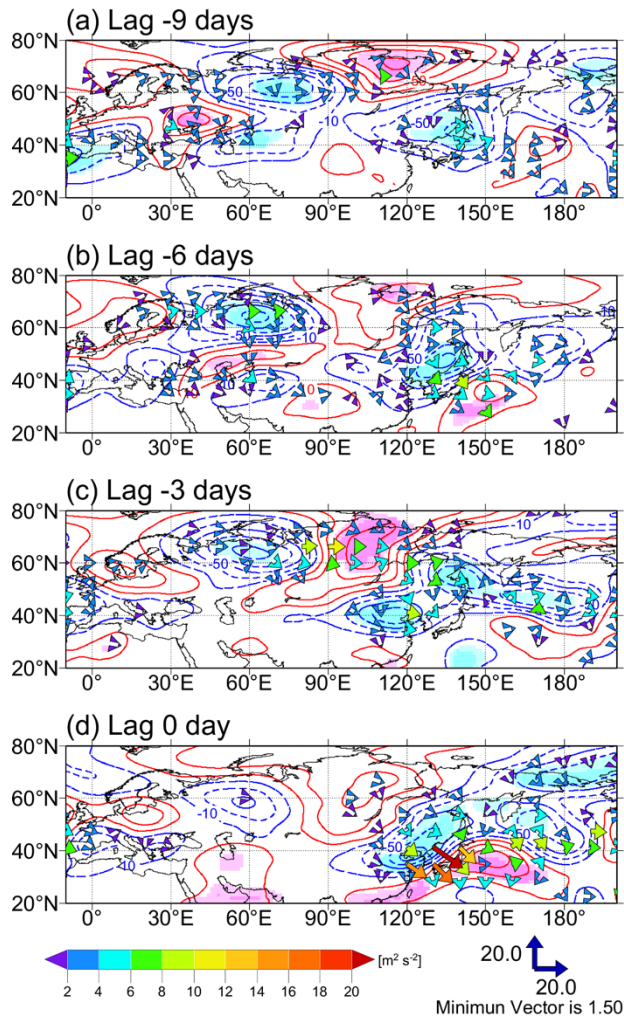


Harada, Y., H. Endo, and K. Takemura, 2020: Characteristics of large-scale atmospheric fields during heavy rainfall events in western Japan: Comparison with an extreme event in early July 2018. *J. Meteor. Soc. Japan*, **98**, 1207-1229. <https://doi.org/10.2151/jmsj.2020-062>.

TP10



Plain Language Summary:

To explore large-scale atmospheric factors causing heavy rainfall events that occurred widely in western Japan, a composite analysis of atmospheric fields during the past heavy rainfall events in the region is performed. We also investigate atmospheric fields during an extreme heavy rainfall event that occurred in early July 2018 (HR18).

Figure 3. Lag composite maps of 3-day mean fields of wave activity flux (WAF, vectors, $m^2 s^{-2}$) and geopotential height anomalies (contours, gpm) at 250 hPa from 9 days before (top panel) to the day of 3-day precipitation peaks (bottom panel) for the highest 10 events (TP10). The contour interval is 20 gpm. The WAFs are calculated from the composite fields. The vector scales of the WAF are shown at the lower-right. The tone bar at the lower-left represents the color scale for the magnitude of WAF.

- The composite analysis indicates that a clear wave train due to quasi-stationary Rossby wave-packet propagation (RWPP) along the polar front jet over Siberia tends to occur just before TP10.
- Surface high-pressure anomalies to the southeast of Japan are dominated by variability with a 25–90-day period, whereas variability with an 8–25-day period dominates lower-pressure anomalies over the East China Sea (ECS) in relation to the development of the upper-tropospheric trough around the Korean Peninsula (KP).
- During HR18, a low-pressure system with an 8–25-day period to the south of Japan developed in association with wave breaking induced by the remarkable RWPP along the sub-tropical jet and propagated northwestward toward the ECS and then to Japan.
- HR18 is also characterized by a sharp upper-tropospheric trough over the KP that is dominated by high-frequency variability with a period less than 8 days.