

Yanase, W., K. Araki, A. Wada, U. Shimada, M. Hayashi, and T. Horinouchi, 2022: Multiple dynamics of precipitation concentrated on the north side of Typhoon Hagibis (2019) during extratropical transition. *J. Meteor. Soc. Japan*, **100**, 783-805.
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Plain Language Summary: Torrential rain in Typhoon Hagibis caused a devastating disaster in Japan in October 2019. The precipitation concentrated in the northern half of the typhoon was attributed to different dynamics depending on the stages of extratropical transition. It was enhanced by reduced moist symmetric stability between the typhoon and a westerly jet stream at the prefrontal stage, whereas it was concentrated in a warm front northeast of the typhoon at the frontal stage.

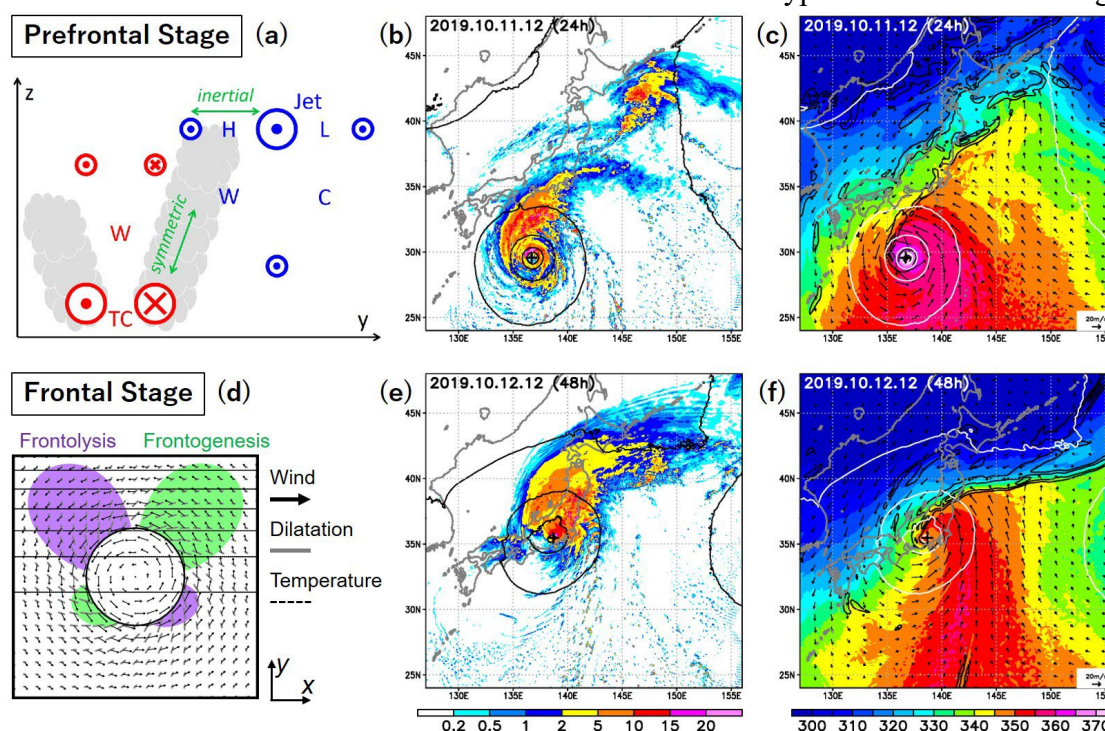


Figure 1. Precipitation dynamics at (a)–(c) the prefrontal stage (1200 UTC on 11 October) and (d)–(f) the frontal stage (1200 UTC on 12 October). (a), (d) Schematic illustration showing the dynamics. (b), (e) Total condensed water path (kg m^{-2} ; colors) in the simulation. (c), (f) Equivalent potential temperature at 530 m ASL (K; colors) and the magnitude of its horizontal gradient [contour interval 1 K (10 km)^{-1}] in the simulation. The thin contours represent sea level pressure at intervals of 20 hPa. The crosses denote the cyclone centers.

- The precipitation mechanism at the frontal stage (12 October) was consistent with that proposed by previous studies; the precipitation was attributed to warm frontogenesis northeast of the typhoon (Figs 1d–1f).
- In contrast, the precipitation at the prefrontal stage (11 October) occurred in a slantwise northward ascending motion enhanced by reduced moist symmetric stability between the typhoon and the westerly jet stream to the north (Figs. 1a–1c).