

Sakurai, N., H. Fudeyasu, P. R. Krehbiel, R. J. Thomas, W. Rison, and D. Rodeheffer, 2022: Positive cloud-to-ground lightning characteristics in the eyewall of Typhoon Faxai (2019) observed by Tokyo lightning mapping array. *J. Meteor. Soc. Japan*, **100**.

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**Plain Language Summary:** Typhoon Faxai (T1915) struck the Kanto region of Japan during September 8 and 9, 2019, producing many lightning discharges. This study investigated the characteristics of the lightning activity in comparison with the internal structure of precipitation in the eyewall. The storm was highly unusual in that it produced a high percentage of positive cloud-to-ground (CG) flashes, despite appearing to be normally electrified.

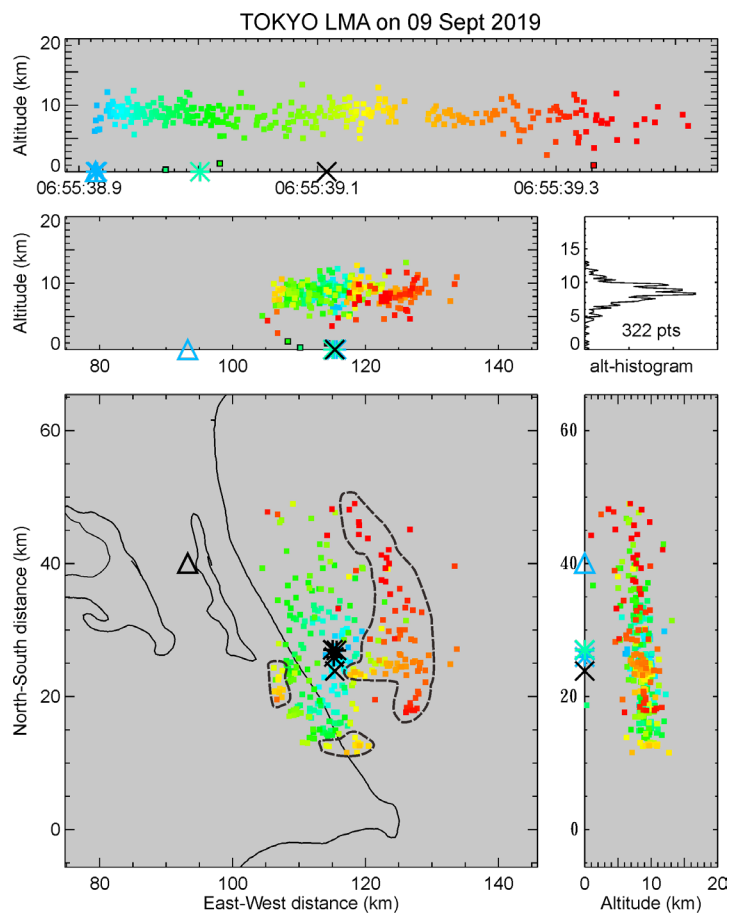


Figure 1. VHF lightning sources for a +CG flash at 06:55:38 JST on September 9 that produced a 117 kA +CG discharge 200 ms into the flash (black  $\times$  symbol). Triangle, cross, and star marks indicate the location and time of -CG, +CG, and +IC events detected by Japanese Lightning Detection Network (JLDN), respectively.

- The energetic positive strokes occurred partway through the flashes. Arrival of ground potential within the cloud initiated characteristic “blooming” of the breakdown in different directions away from the extremities of the preceding activity, including an entirely new branch to the east and north.
- That the normally-electrified storm produced positive instead of negative CG flashes indicates that the convective core of the storm had a depleted mid-level negative charge.
- The storm’s upper positive charge was advected downwind from above the convective core by strong upper level winds, giving rise to horizontally extensive flash extents.