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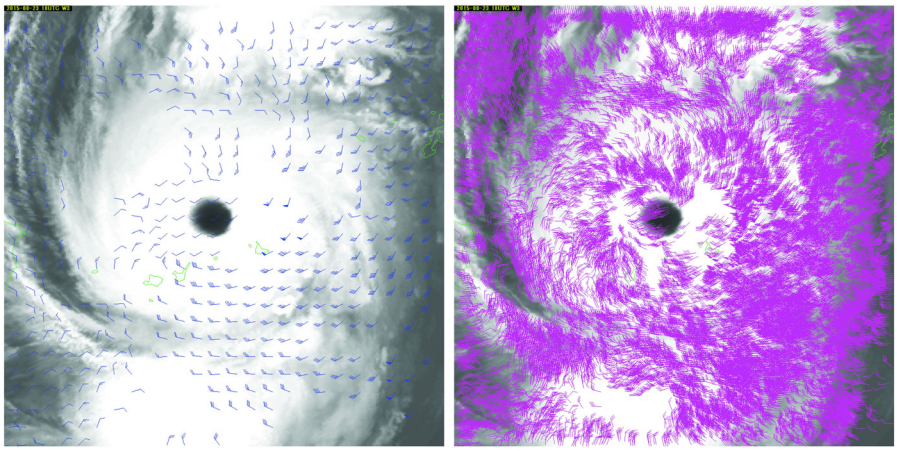

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Figure 1. Spatial distributions of upper tropospheric MTSAT AMVs (left) and Himawari-8 AMVs (right) for Typhoon Goni (1515) at 1800 UTC on 23 August 2015.

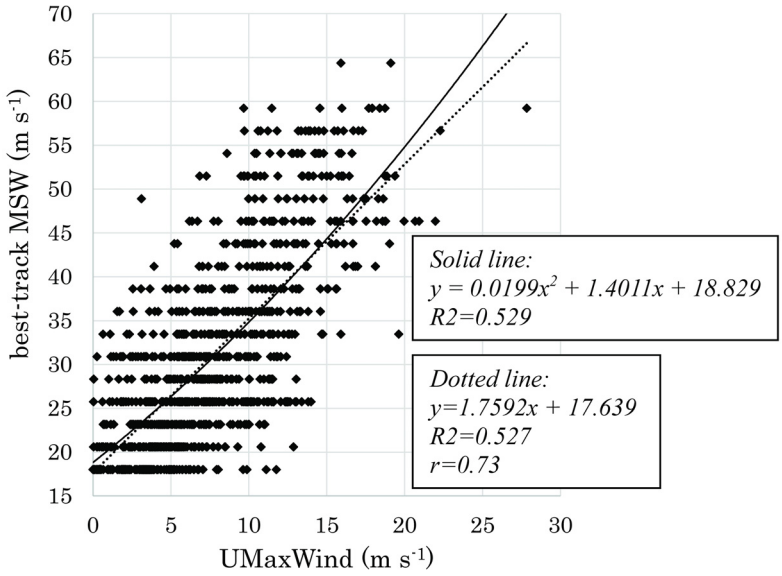

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Figure 2. Scatter plots between the maximum tangential winds of MTSAT upper tropospheric AMVs (x-axis) and JMA best-track MSWs (y-axis) for 44 TCs in 2011–2014. The number of data is 1064. Dotted and solid lines are the first-order polynomial and second-order polynomial regression equations, respectively. *r* denotes the correlation coefficient.

- This study identified the characteristics of cloud-top winds that indicate tropical cyclone (TC) intensification by analysis of the upper tropospheric atmospheric motion vectors (AMVs) of TCs occurring in the western North Pacific basin (Fig. 1).
- It was noteworthy that the maximum tangential wind of upper tropospheric AMVs was highly correlated with the best-track maximum sustained wind (Fig. 2), suggesting that the cyclonic circulation near the cloud top was intensified by the upward transport of the absolute angular momentum from the surface to the upper troposphere within TC inner core. Meanwhile, the radial outflow near the cloud top captured by the AMVs represented the outward movement of upper tropospheric clouds such as anvils from deep convection in TC inner core.
- The case study using Typhoon Lionrock (1610) showed a capability of Himawari-8's high-resolution AMVs to support TC intensity and structure analyses.