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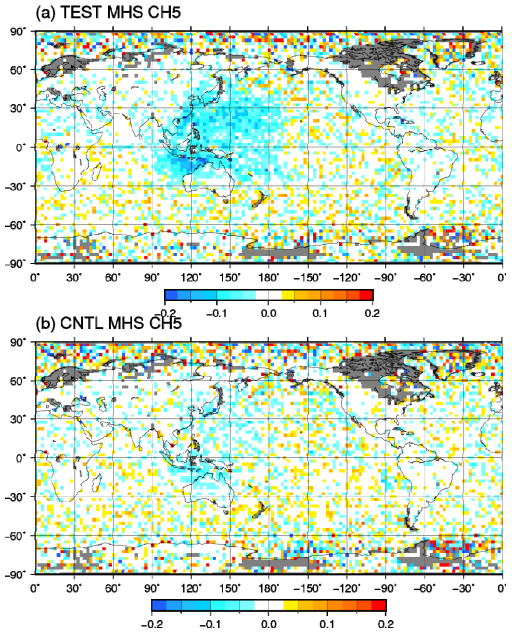

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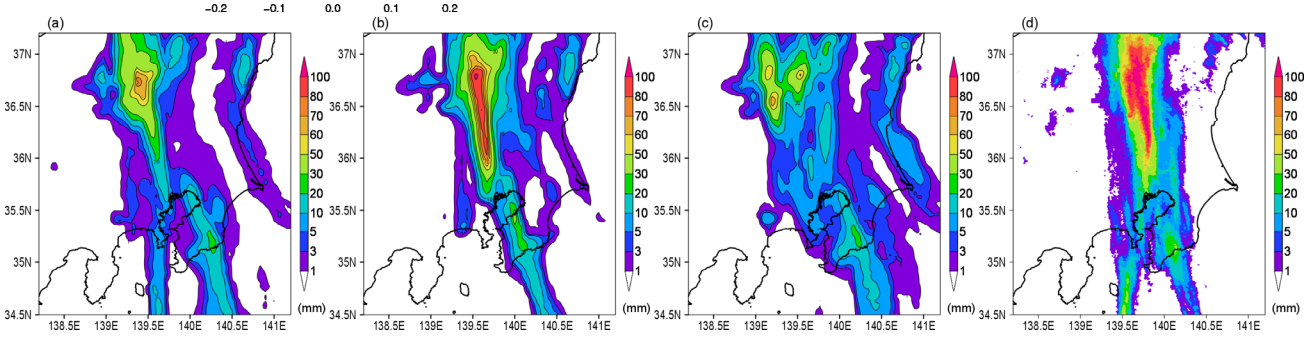
Figure 1. Distribution of reduced RMS in MHS (Microwave Humidity Sounder) FG departure with colors indicating normalized changes.
(a) MHS Channel 5 for TEST, (b) MHS Channel 5 for CNTL. The MHS data used for the statistics are those assimilated in the experiments. Blue areas indicate RMS reduction representing water vapor field improvement in the channel's sensitive layer. The period is from May 26 to September 30, 2015.



↑ Figure 2. Comparison of three-hour cumulative rainfall forecasts for 15 UTC on September 9, 2015. The forecast period is three hours. (a) CNTL (with MTSAT-2 CSR), (b) TEST (with Himawari-8 CSR), (c) BASE (no CSR), and (d) observed rainfall distribution from ground-based radar observations and rain-gauge data. The unit of rainfall is mm/3 hr.

- In data assimilation experiments using JMA's global NWP system, the assimilation of Himawari-8's three water vapor bands (TEST) significantly improved the tropospheric humidity field in analysis, especially in the lower troposphere, as compared to assimilation of the single MTSAT-2 water vapor channel (CNTL). First-guess (FG) departure statistics for microwave humidity sounders indicated an improvement in the water vapor field, especially over Himawari-8 observation areas (Fig. 1).
- In data assimilation experiments using JMA's mesoscale NWP system, a single water vapor band of Himawari-8 CSR corresponding to MTSAT-2 was assimilated, resulting in enhanced contrast of the water vapor field between moist and dry areas, as well as a realistic representation of moist air flows from the ocean in analysis. The changes also improved mesoscale model heavy precipitation forecasts (Fig. 2).