

Improvement of Himawari-9 observation data quality

The Japan Meteorological Agency (JMA) is planning to update its Himawari-9 ground processing system at 03:00 UTC on 24 March 2025 to improve image quality for bands 1 to 4 of Himawari Standard Data (HSD). The data format will remain the same.

The Advanced Himawari Imager (AHI) units on board Himawari-8 and -9 have up to around 1,500 detectors aligned north-south for each band. Differences in detector responses are calibrated via ground data processing, but east-west stripes may appear in imagery depending on the band and observation conditions.

In addition to east-west scanning in daily operation, the AHIs have north-south (NS) scanning functionality. This can be used in observation over spatially homogeneous Earth areas to allow estimation of responsivity differences among detectors. Against this background, JMA developed an algorithm (in collaboration with the prime satellite contractor) before the operational switchover from Himawari-8 to -9 in 2022 to mitigate stripes in Himawari-9's bands 1 to 4 images. This is done by correcting the calibrated radiances derived from NS scan data in 2022. Figure 1 shows Band 1 mitigation, with stripes mainly seen over bright cloud areas. The algorithm was applied to Band 3 upon switchover from Himawari-8 to -9, while a revised version will be applied to bands 1 to 4 to further mitigate striping issues.

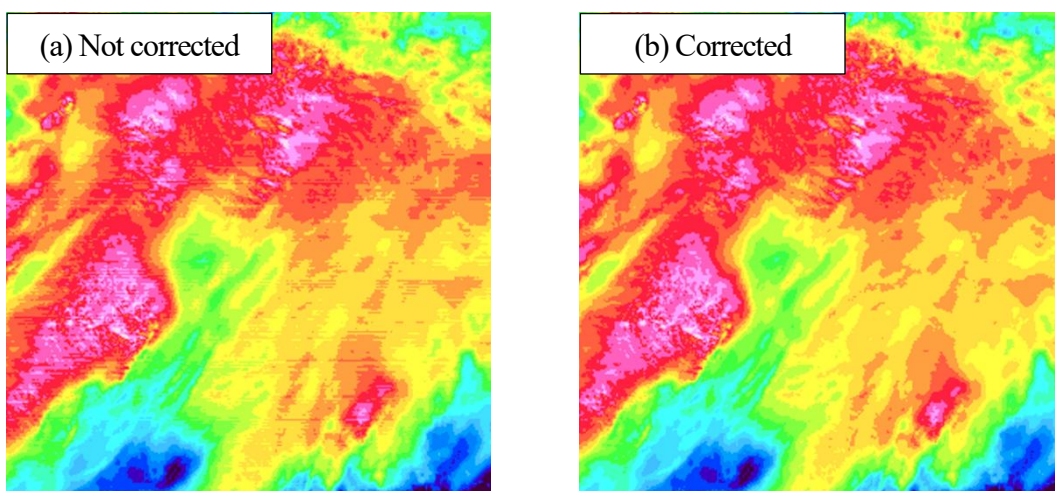


Fig. 1. Band 1 reflectivity for cloudy areas in full-disk imagery at 15:10 UTC on 6 August 2023. (a) before improvement; (b) after. The clear stripes seen over the yellow-to-red areas in (a) are significantly mitigated in (b).