

Assimilation and evaluation of all-sky infrared radiances of Himawari-8

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We aim at effective assimilation of all-sky infrared radiances (ASRs) from Himawari-8 satellites in global and regional data assimilation systems. The ASR assimilation is expected to give us greater benefit of improving analysis and forecasts than the current clear-sky radiance (CSR) assimilation.

We have been developing ASR assimilation in a regional assimilation system by using a cloud resolving model of JMA-NHM and LETKF assimilation system. With a cloud-dependent QC procedure and observation error model, ASRs at humidity bands of Himawari-8 showed Gaussian distribution form. ASR assimilation made first-guess better fit to observations such as CloudSat than CSR assimilation.

With regard to the global data assimilation of ASRs, we started with comparing simulations and observations for ASR of Himawari-8. To better understand the discrepancy between model and simulations, we used a different radiative transfer model (Joint-Simulator) from the one employed for assimilation (RTTOV). The comparison revealed a problem with input for RTTOV and sensitivity of Joint-Simulator to the number of subgrid columns and response function.

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