

Assimilating every-10-minute Himawari-8 infrared radiances to improve convective predictability

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Improving the predictability of sudden local severe weather is a grand challenge for numerical weather prediction. Recently, the capability of geostationary satellites to observe infrared radiances has been significantly improved, and it is expected that the 'Big Data' from the new generation geostationary satellites contribute to improving convective predictability. We examined the potential impacts of assimilating frequent infrared observations from a new generation geostationary satellite, Himawari-8, on convective predictability. We implemented the real-data experiment in which Himawari-8 all-sky moisture sensitive infrared radiances of band 8 ($6.2\mu\text{m}$) and band 10 ($7.3\mu\text{m}$) were assimilated into the high-resolution (2km) limited area model every 10 minutes. The frequent infrared observations from Himawari-8 improve the analysis and forecast of isolated convective cells and sudden local severe rainfall induced by weak large-scale forcing. The results imply that satellite data assimilation can contribute to better forecasting severe weather events in smaller spatiotemporal scales than the previous studies.