Assimilating All-Sky Himawari-8 Satellite Infrared Radiances: A Case of Heavy Rainfalls and Floods

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To predict heavy rainfalls and floods, it is important to get better initial conditions with accurate moisture transport via data assimilation. To do so, infrared (IR) radiance observations by geostationary satellites can give useful information in a wide area because some IR bands are sensitive to moisture. In particular, the new Japanese geostationary satellite "Himawari-8" can provide high-spatiotemporal resolution observations with many bands. The present study aims to assimilate all-sky IR radiance observations by Himawari-8 and investigate its impact on the analyses and forecasts of a heavy rainfall event in Japan. The results show that northward moisture transport over the ocean south of Japan is enhanced due to Himawari-8 data. The improved analyses give much better precipitation forecasts compared to the control experiment without Himawari-8 IR observations. The improved precipitation forecasts are essential for more accurate river model forecasts.

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