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衛星観測データ同化の将来展望
Satellite Data Assimilation: A Perspective

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Satellite observations play a central role in contemporary numerical weather prediction (NWP) through recent developments of advanced data assimilation methods. Data assimilation integrates observations and a numerical simulation, and aims to bring synergy. Studies have shown that satellite microwave and infrared sounder data have a significant positive impact on NWP. However, more satellite data exist than currently used in the operational NWP systems. An example includes satellite-based precipitation measurements, such as GPM data, which potentially improve NWP. However, until recently it has been a very difficult problem to improve medium-range NWP through precipitation data assimilation. Different types of satellite data can be integrated into NWP and other earth environmental simulations as data assimilation techniques keep advancing. In the future, more advanced sensors will provide orders of magnitude more data than the current sensors. For example, Advanced Himawari Imager (AHI) of the new generation geostationary satellite Himawari-8 produces two orders of magnitude more data than the currently-used geostationary satellites. As computers advance consistently, data assimilation will face the problem to integrate "Big Data" from new sensors and "Big Simulations" from big computers. We would expect to enter this "Big Data Assimilation" era. Here, I believe a "co-design" among specialists in satellite observations, data assimilation, and computer science is an important concept. In this presentation, I will present my personal perspective on the future of satellite data assimilation.

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