On the impact of aircraft data on global numerical weather prediction

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The numerical weather prediction (NWP) targeting the global atmosphere provides basic information on day-to-day weather forecasts and disaster prevention information, and it is also the basic technology for climate analysis and prediction. Since the prediction precision largely depends on the accuracy of the initial state, the data assimilation method such as the 4-dimensional variational method is used to generate it, and several million observation data are assimilated per day. Among such enormous data, aircraft observation data (temperature, wind, (relative humidity)) is one of the main observations. In order to improve the accuracy of the initial state, it is important to evaluate the influence of individual observation data on forecast accuracy. In this presentation, we evaluate the contribution of each observation dataset to forecast precision using the adjoint-based observation impact estimation method, which uses adjoint codes of the NWP model and the data assimilation system. We would like to think about future tasks such as bias correction method with aircraft observation data.

