Increase of ATOVS radiance data in the JMA global data assimilation system in 2007

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JMA ingested additional ATOVS radiance data in the global data assimilation system in 2007.

AMSU-A and MHS from NOAA18 satellite, and those from Metop-A were introduced in April 2007, and in November 2007, respectively. The cycle experiments to assess the effects of these new satellite data showed the positive impacts on forecast skills in terms of the 500hPa geopotential height (data not shown).

AMSU-A, AMSU-B and MHS radiances from the Asia-Pacific Regional ATOVS Retransmission Service (A-P RARS) were added in February 2007. A-P RARS ATOVS data are directly received at stations in Japan, Australia, China and Korea, and distributed to NWP centers via GTS in a short time in order to meet the data cut-off time of early analysis (2h20m). Figure 1 shows the difference between the early analysis and the cycle (delayed) analysis of 20hPa geopotential height at 06UTC on 25 September 2006. The large negative (positive) difference is colored with blue (red). With A-P RARS data in Fig.1(b), the early analysis is closer to the delayed analysis, which is believed to be more reliable because the sufficient data is available due to its longer cut-off time length (5h35m for 00 and 12 UTC and 11h35m for 06 and 18 UTC), compared with Fig.1(a). The amount of available data, on average, increases by a factor of 1.1 to 1.4. Furthermore, the EUMETSAT Advanced Retransmission Service (EARS) ATOVS data were added in August 2007 as they were proved to have positive impacts on the analysis and the forecast for 500hPa geopotential height in the Northern Hemisphere in the impact studies.

(a) without A-P RARS   (b) with A-P RARS
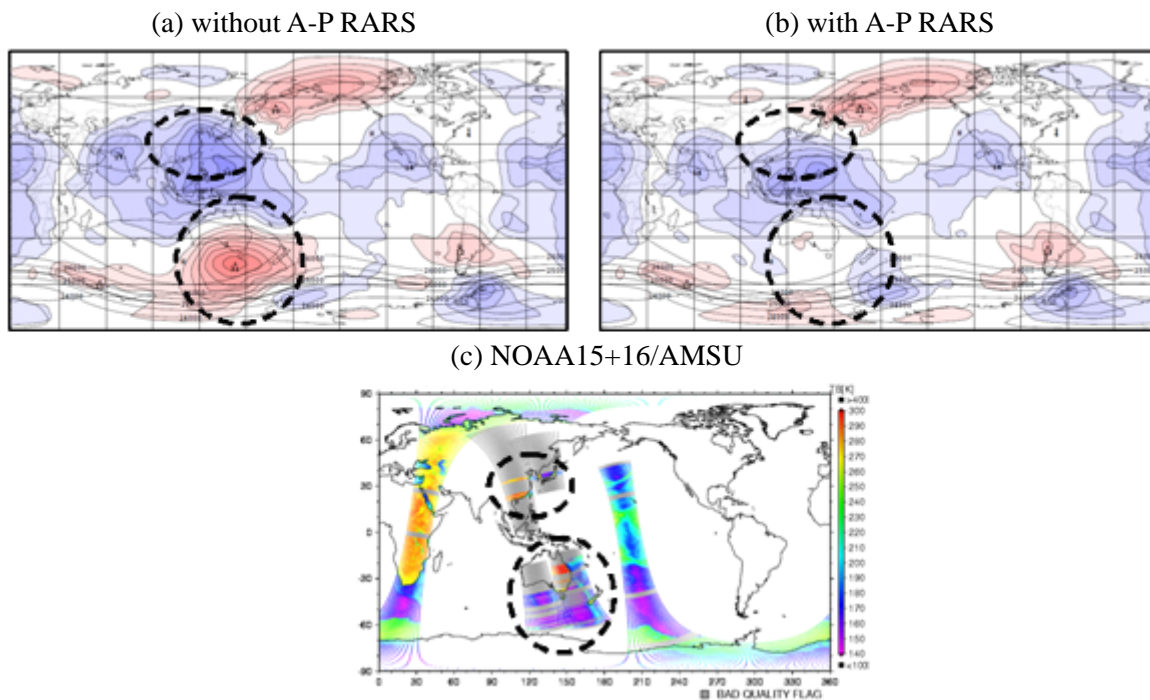

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Fig.1 Difference between the early analysis and the cycle (delayed) analysis of 20hPa geopotential height (at 06UTC on 25 September 2006) without A-P RARS data of Beijing and Melbourne (a), and with A-P RARS data (b). The blue (red) shades show the positive (negative) value of the difference, and the contour interval is 4m. (c) is the coverage of Beijing and Melbourne (circled area).