



Observation impact estimation using a forecast sensitivity to observation (FSO) method in the global and east Asia regions

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This study investigated the observation impact to the forecast for the summer and winter months (i.e. JJA 2011 and DJF 2011-2012) in the global and east Asia regions, using the forecast sensitivity to observation (FSO) tool in the Korea Meteorological Administration (KMA) Unified Model (UM). The SONDE, AIRCRAFT, SURFACE, BOGUS, NOAA ATOVS, MetOp2 ATOVS, IASI, AIRS, GPSRO, SSMIS, Communication, Ocean and Meteorological Satellite (COMS) of KMA, AMV of JMA, ESA, GEOS, MSG, and ASCAT observations were used to estimate the observation impact to the forecast. Overall each observation showed consistent contribution to the forecast error reduction for summer and winter months.

In the global region, the observation impact to the forecast error reduction depended on the number of observations assimilated in the numerical model. The contribution of the SONDE to the forecast error reduction is the largest, followed by NOAA / MetOp2 ATOVS and IASI. In satellite sounding observations, the contribution of channel number 5, 6, 7 of NOAA AMSU-A and channel number 56-215, 271-280 of IASI to the forecast error reduction were large.

In the east Asia region, the contribution of the SONDE to the forecast error reduction was the largest, similar to that in the global region. However, the contribution of the satellite data to the forecast error reduction was decreased when compared to that in the global region because of exception of millions of satellite observations located the ocean and southern hemisphere. Especially, Atmospheric Motion Vector (AMV) observations of COMS launched in 2009 showed the largest impact among several Imager sensors.