

**Specifications (as of 31 December 2020) – an excerpt from the Joint WMO Technical Progress  
Report on the Global Data Processing and Forecasting System and Numerical Weather Prediction  
Research Activities for 2020**

**Specifications of the Meso-scale Analysis (MA)**

Analysis time	00, 03, 06, 09, 12, 15, 18 and 21 UTC
Analysis scheme	Incremental 4D-Var using a tangent linear forward model in the inner step with low resolution
Data cut-off time	50 minutes for analysis at 00, 03, 06, 09, 12, 15, 18 and 21 UTC
First guess	3-hour forecast produced by ASUCA
Domain configuration (Outer step)  (Inner step)	Japan and its surrounding area Lambert projection; 5 km at 60°N and 30°N, 817 × 661 Grid point (1, 1) is at the northwest corner of the domain. Grid point (565, 445) is at 140°E, 30°N. Lambert projection; 15 km at 60°N and 30°N, 273 × 221 Grid point (1, 1) is at the northwest corner of the domain. Grid point (189, 149) is at 140°E, 30°N.
Vertical coordinate	z-z* hybrid
Vertical levels	(Outer step) 76 levels up to 22 km (Inner step) 38 levels up to 22 km
Analysis variables	Wind, potential temperature, surface pressure and pseudo-relative humidity, skin temperature, ground temperature and soil moisture
Observations (as of 31 December 2018)	SYNOP, SHIP, BUOY, TEMP, PILOT, Wind Profiler, Weather Doppler radar (radial velocity, reflectivity), AIREP, AMDAR, Typhoon Bogus; AMVs from Himawari-8; ocean surface wind from Metop-A, B/ASCAT; radiances from NOAA-15, 18, 19/ATOVS, Metop-A, B/ATOVS, Aqua/AMSU-A, DMSP-F17, 18/SSMIS, GCOM-W/AMSR2, GPM-core/GMI, WV-CSR of Himawari-8; radar-raingauge analyzed precipitation; precipitation retrievals from DMSP-F17, 18/SSMIS, GCOM-W/AMSR2, GPM-core/GMI, GPM-core/DPR; GNSS RO refractivity data from Metop-A, B/GRAS, COSMIC/IGOR, TerraSAR-X/IGOR, TanDEM-X/IGOR; total precipitable water vapor from ground-based GNSS
Assimilation window	3 hours
System documentation URL	<a href="https://www.jma.go.jp/jma/jma-eng/jma-center/nwp/nwp-top.htm">https://www.jma.go.jp/jma/jma-eng/jma-center/nwp/nwp-top.htm</a>