

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

MEPS specifications

1. System	
System	Meso-scale Ensemble Prediction System
Date of implementation	27 June 2019
2. Configuration	
Domain	Japan and its surrounding area Lambert projection, 817 × 661 grid points
Horizontal resolution	5 km at 60 and 30°N (standard parallels)
Vertical levels	76
Model top	22 km
Forecast length	39 hours
Runs per day (times in UTC)	4 (00, 06, 12 and 18 UTC)
Members	One unperturbed control forecast and 20 perturbed ensemble members
Coupling with ocean/wave/sea ice models	None
Integration time step	100/3 seconds (3-stage Runge-Kutta method)
3. Initial conditions and perturbations	
Initial perturbation strategy	Singular vectors (SVs); linear combination of MSV40s, MSV80s and global SVs (GSVs)
Horizontal resolution of perturbations	MSV40: 40 km MSV80: 80 km GSV: Spectral triangular 63 (TL63), reduced Gaussian grid system, roughly equivalent to 2.8125 × 2.8125° (270 km) in latitude and longitude
Optimization time in forecast	MSV40: 6 hours MSV80: 15 hours GSV: 45 hours
Target area	MSV40: 125 – 145°E, 25 – 45°N MSV80: 125 – 145°E, 25 – 45°N GSV: 120 – 170°E, 25 – 45°N For MSV, grid points with 925 hPa vorticity lower than a certain threshold were removed from the rectangular target area
Data assimilation for control analysis	4D-Var analysis with mixing ratios of cloud water, cloud ice, rain, snow and graupel derived from preceding forecasts in consideration of consistency with analysis field for relative humidity
Initial conditions for perturbed members	Perturbations added to control analysis in +/-pairs
4. Lateral boundary perturbations	
Lateral perturbation strategy	Based on integration of GSV (a large-scale component of initial perturbation) using the tangent linear model
5. Other model details	
	All ensemble members use exactly the same model as the MSM.