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

GSM 11-day forecast specifications

1. System	
Model (version)	Global Spectral Model (GSM2003)
Date of implementation	24 March 2020
2. Configuration	
Horizontal resolution (Grid spacing)	Spectral triangular 959 (TL959), reduced Gaussian grid system, roughly equivalent to 0.1875 × 0.1875° (20 km) in latitude and longitude
Vertical resolution (model top)	100 stretched sigma pressure hybrid levels (0.01 hPa)
Forecast length (initial time)	132 hours (00, 06, 18 UTC) 264 hours (12 UTC)
Coupling to ocean/wave/sea ice models	None
Integration time step	400 seconds
3. Initial conditions	
Data assimilation	Four-dimensional variational (4D-Var) method
4. Surface boundary conditions	
Treatment of sea surface	Climatological sea surface temperature with daily analysis anomaly Climatological sea ice concentration with daily analysis anomaly
Land surface analysis	Snow depth: two-dimensional optimal interpolation scheme Temperature: first guess Soil moisture: climatology
5. Other details	
Land surface and soil	Simple Biosphere (SiB) model
Radiation	Two-stream with delta-Eddington approximation for short wave (hourly) Two-stream absorption approximation method for long wave (hourly)
Numerical techniques	Spectral (spherical harmonic basis functions) in horizontal, finite differences in vertical Two-time-level, semi-Lagrangian, semi-implicit time integration scheme Hydrostatic approximation
Planetary boundary layer	Mellor and Yamada level-2 turbulence closure scheme Similarity theory in bulk formulae for surface layer
Convection	Prognostic Arakawa-Schubert cumulus parameterization
Cloud	PDF-based cloud parameterization
Subgrid orography	Low-level blocked-flow drag, gravity wave drag and turbulent orographic-form drag schemes
Non-orographic gravity wave drag	Spectral gravity wave forcing scheme
6. Further information	
Operational contact point	globalnwp@met.kishou.go.jp
System documentation URL	https://www.jma.go.jp/jma/jma-eng/jma-center/nwp/nwp-top.htm