LFM specifications

1. System	
System	Local Forecast Model (forecast model:ASUCA)
Date of implementation	30 Aug. 2012 (ASUCA: 29 Jan. 2015)
2. Configuration	
Domain	Japan, Lambert projection, 1,531 × 1,301 grid points
Horizontal resolution	2 km at 60 and 30°N (standard parallels)
Number of model levels	58
Model top	20.2 km
Forecast length	9 hours
Runs per day (times in UTC)	24 (00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 UTC)
Coupling to ocean/wave/sea ice models	None
Integration time step	50/3 seconds (3-stage Runge-Kutta method)
3. Initial conditions	
Data assimilation method	The LA produces initial conditions via a three-hour analysis cycle based on hourly assimilation with 3D-Var and one-hour forecasts.
4. Surface boundary conditions	
Sea-surface temperature	SST (fixed during time integration) and sea-ice distribution from MSM
Land surface analysis	Climatological values of evaporability, roughness length and albedo Snow cover analysis from MSM
5. Lateral boundary conditions	
Model providing lateral boundary conditions	MSM
Lateral boundary condition update frequency	8 times/day 00 – 13-hour forecasts using the latest MSM information
6. Other model details	
Soil scheme	Ground temperature prediction using an eight-layer ground model Evaporability prediction initialized using climatological values depending on location and season
Radiation	Short wave: two-stream with delta-Eddington approximation (every 15 minutes) Long wave: two-stream absorption approximation method (every 15 minutes)
Large-scale dynamics	Finite volume method on Arakawa-C-type staggered coordinates, horizontally explicit and vertically implicit time integration scheme, combined third- and first-order upwind horizontal finite difference schemes in flux form with a limiter by Koren (1993) in advection treatment for monotonicity Fully compressible non-hydrostatic equations
Boundary layer	Improved Mellor-Yamada Level 3 scheme Similarity theory adopted for surface boundary layer
Convection	Convective initiation
Cloud/microphysics	Three-ice bulk cloud microphysics Time-split treatment for rain and graupel precipitation Cloud water and cloud cover diagnosis using a partial condensation scheme
Orography	Mean orography smoothing to eliminate shortest-wave components
Horizontal diffusion	None
Gravity wave drag	None