Deutscher Wetterdienst

17th North America-Europe Data Exchange Meeting
26-28 May 2004, Montreal

Deutscher Wetterdienst Status Report

Reinhold Hess, DWD
email: reinhold.hess@dwd.de

1 Main Events in NWP since the last Report

1.1 GME (Global Model)

- hydrostatic, icosahedral-hexagonal grid, mesh size≈60 km

- terrain following hyb. coordinate, 31 layers

- forecast range: 174 h for initial dates 00, 12 UTC and 48 h for 18 UTC

NEW: Cloud ice has been introduced as additional prognostic variable of the atmosphere. Sea ice is initialized using NCEP sea-ice analysis; growing ice thickness and ice melting are simulated during model run.

1.2 LM (Local Model)

- non-hydrostatic, rotated latitude-longitude grid, mesh size 7 km

- terrain following hyb. coordinate, 35 layers

- forecast range: 48 h for initial dates 00, 12, 18 UTC

NEW: Cloud ice has been introduced as additional prognostic variable of the atmosphere. Rain and snow is advected during fall down according to actual winds, resulting in an offset of precipitation up to about ten grid boxes (for snow).

1.3 GME Analysis

- OI, 3-hourly intermittent analysis, observation window +/−1.5 h, cut-off: 2 h 30 min

- observations: conv., AIREP, AMDAR, ACARS, SATEM (NOAA 15, 16), SATOBS(GOES E and W, GMS, Meteosat 5 and 7), PAOB

NEW: Modis polar winds of both AQUA and TERRA are assimilated operationally since autumn 2003. Pseudo temps (i. e. temperature, humidity and wind profiles of IFS/ECMWF) are assimilated one time per day since december 2003.

2 Data Usage

2.1 ATOVS 120 km retrievals and clear radiances in BUFR

Used operationally, sole ATOVS source for NWP up to now. To be sub-
stitued with usage of ATOVS radiances with 1D-Var (see 2.2). Plans to
receive the data for monitoring and validation until mid 2005.

2.2 ATOVS level 1B data

ATOVS level 1B data are received at METO, who encodes it in BUFR and
transmits it as level 1C to DWD in near real time. Data is monitored since
2003, trial experiments to assimilate the data with view towards operational
usage are under way. Current assimilation method is 1D-Var for OI (opti-
mal interpolation) analysis. Development of 3D-Var for direct assimilation
of 1B data has reached implementation of prototype. Usage of ATOVS
120 km retrievals (2.1) will be restricted to monitoring and validation after
operational incroduction of radiances.

2.3 ATOVS and AVHRR level-0 raw HRPT data from NOAA/NESDIS

Plans to use these data for the LM (Local Model) and assimilated it with
1D-Var and the nudging assimilation scheme of the LM. Possibly used also
for impoving the timeliness of ATOVS radiances on the northern hemisphere
for the GME (Global Model).

2.4 AVHRR products on HIRS grid, derived as part of NESDIS ATOVS processing

Plans to use the cloud fraction product for cloud detection for HIRS. Evalua-
tion of this product had started but is deferred until a second AVHRR/AMSU-
A/HIRS combination becomes available with NOAA-18.

2.5 SeaWinds Scatterometer Data

QuikScat data received and monitored with view towards operational usage;
implementation is in progress.

2.6 MODIS polar winds

MODIS polar winds from both Terra and Aqua are operationally assim-
ilated in the global model since autumn 2003. Current experimentation
focuses on replacing the SATOB winds from geostationary satellites by the
EUMETSAT and NESDIS BUFR products.

2.7 SSM/I brightness temperatures

Data received from METO, plans for monitoring with view towards opera-
tional usage.

2.8   SSM/IS

Plans for monitoring with view towards operational usage.

2.9   Altimeter wave/wind data

JASON data is received and will be used for an operational wave model for the north sea.

2.10   AQUA AIRS+AMSU-A+HSB data

Sampled data (324 channels, selected fovs) of AIRS data and AMSU-A data are received and monitored with intention of operational assimilation.

2.11   NCEP sea-ice analysis

Used operationally. Sea-ice of GME is initialized with this product once a day and its growing and melting is simulated during model run.

2.12   GOES cloud-tracked VIS/IR/WV winds

Used operationally in thinned form.

2.13   GMS cloud-tracked VIS/IR/WV winds processed at NESDIS

Plans to compare with Japanese product that is used operationally.

2.14   Snow cover analysis for N. Hemisphere

Data (including snow depths) used operationally in 25 km resolution.