

# Operational HIRLAM at KNMI and the June upgrade

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## 1 Current setup

On March, 5th, 2002, KNMI started using HIRLAM 5.0.6 operationally. The main features are of this setup are:

- Horizontal grid: 406 x 324 cells of 0.2 x 0.2 degrees.
- Vertical grid: 31 standard layers.
- Analysis: Optimum Interpolation.
- Initialisation: DFI.
- Hardware: 36 900 Mhz UltraSparc III processors in a Sun Fire 15K.

## 2 Next version

Our next operational setup will (from June, 8th onwards) use the following:

- HIRLAM 6.2.2 + physics upgrades from 6.2.4
- Horizontal grid: The same as above.
- Vertical grid: 40 standard layers.
- Analysis: 3D variational analysis.
- Initialisation: Launching DFI.
- Special: Adapted roughness length over land (The Netherlands is not as smooth as the North Sea !).
- Hardware: 50 900 Mhz UltraSparc III processors in a Sun Fire 15K.

### 3 Rationale and Verification

Going to 3DVAR as the method of data assimilation is a must if we are to use new data sources from local measurements in the Netherlands (radar and others).

Launching DFI is necessary to get rid of initial "bumps" in various model area wide parameters, such as the momentum flux. Although the mechanism is not yet fully understood, we assume that running the model backwards adiabatically is physically unsound and leads to a incorrect initial state for the forward part. Note that this means our forecast starts at +1 hour.

The pre-operational run I described above gives better 10 meter winds (vector difference over the Netherlands up to 4 m/s versus 5 m/s for the RCR run and our operational 5.0.6 HIRLAM). The main reason for this improvement lies in the better roughness length.

The 2 meter temperature over the Netherlands improves especially in the first 24 hours with respect to our operational system (RMS error of 1 - 1.4 degree versus 1.8 - 2 degrees for the old system).

The RMS error of pressure at mean sea level is markedly better in the second half of the 48 hour forecast (200 - 300 Pa versus 300 - 450 for the old system).

For the latter two parameters our pre-operational run is close to RCR in meteorological performance.