

# A one-dimension operational *nowcasting* model for Germany

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As a matter of fact, effective *Nowcasting* presumes short time access to meteorological parameters, their analysis and a very short range monitoring up to two hours. This heuristical and empirical *Nowcasting Model NM* consists of numerous modules focused to hazardous weather events such as Cb/Ts, precipitation, hail and so on (see W. Wehry, *A 1-Dimensional Model for Nowcasting of Hazardous Weather Events*). COST78 action plan inspired this technique and development. Based on the model output of DWD *Deutschland Modell DM*, we implemented the horizontal grid pattern 109x109 in dimension.

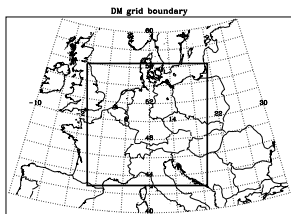


Fig.1: Model domain of current *Deutschland Modell* (DM3)

Because of neglecting  $\sigma$ - or  $p$ - levels, down or upward motions are parameterized by computed particular parameters (*Totals Index*). Meteorological parameters of various platforms, e.g. *synops*, *temps*, radar and satellite data (METEOSAT) are involved. Cloudtop temperatures are derived by DMO and METEOSAT data. Each module may be processed separately, but intersection within the model is considered.

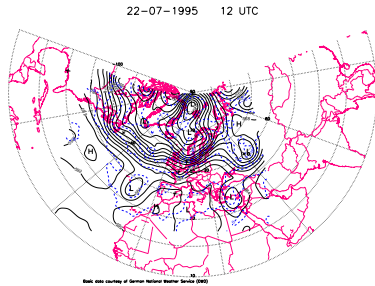


Fig.2: 500 hPa analysis (EM), Saturday July 22nd, 1995, 12 UTC

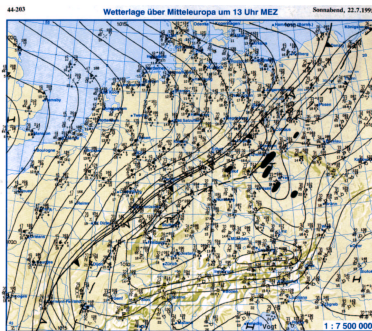


Fig.3: Surface analysis, Saturday July 22nd, 1995, 12 UTC (*Berliner Wetterkarte*)

With regard to intensive data initialization and assimilation routines CPU processing time was minimized effectively. An exemplary figure (4) demonstrates a processed warning module for Cb/Ts at time  $t=t+0$  [h].

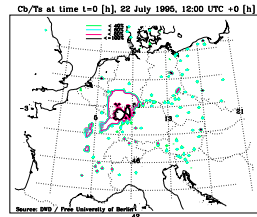


Fig.4: Cb/Ts warning at time  $t=t+0$  [h]; (July 22nd, 1995, 12 UTC)

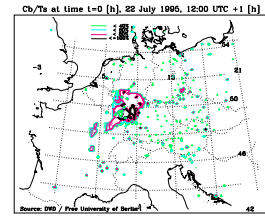


Fig.5: Cb/Ts warning at time  $t=t+1$  [h]; (July 22nd, 1995, 12 UTC)

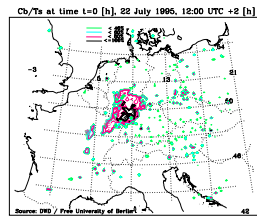


Fig.6: Cb/Ts warning at time  $t=t+2$  [h]; (July 22nd, 1995, 12 UTC)

METEOSAT-5 Cloudtop TT 22 July 1995 1200 UTC

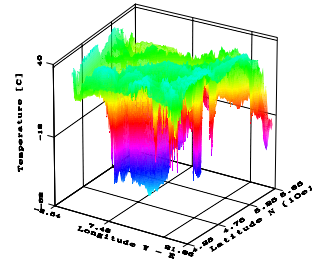


Fig.7: 3D representation of METEOSAT-5 derived cloudtop temperatures [°C] plotted to DM grid

Figure (8) presents the *nowcasted* information of a warning event at time  $t=t+1$  [h] as one superposition of METEOSAT image with slot number 24 and the available Totals Index deduced from DMO data at time  $t=t+0$  [h]. The extrapolation of an additional timestep to  $t=t+2$  [h] will be seen in figure (6), but an operational implementation is not yet tested.

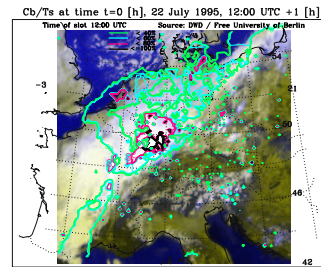


Fig.8: Cb/Ts warning at time  $t=t+1$  [h]; (22 July 1995, 12 UTC)

First case studies to particular modules provide important settings for application. Anyway a verification phase to a one year time section must be carried out before this model will become operational. The modular topology and results of one case study to the Cb/Ts module will be presented.

## Literature:

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