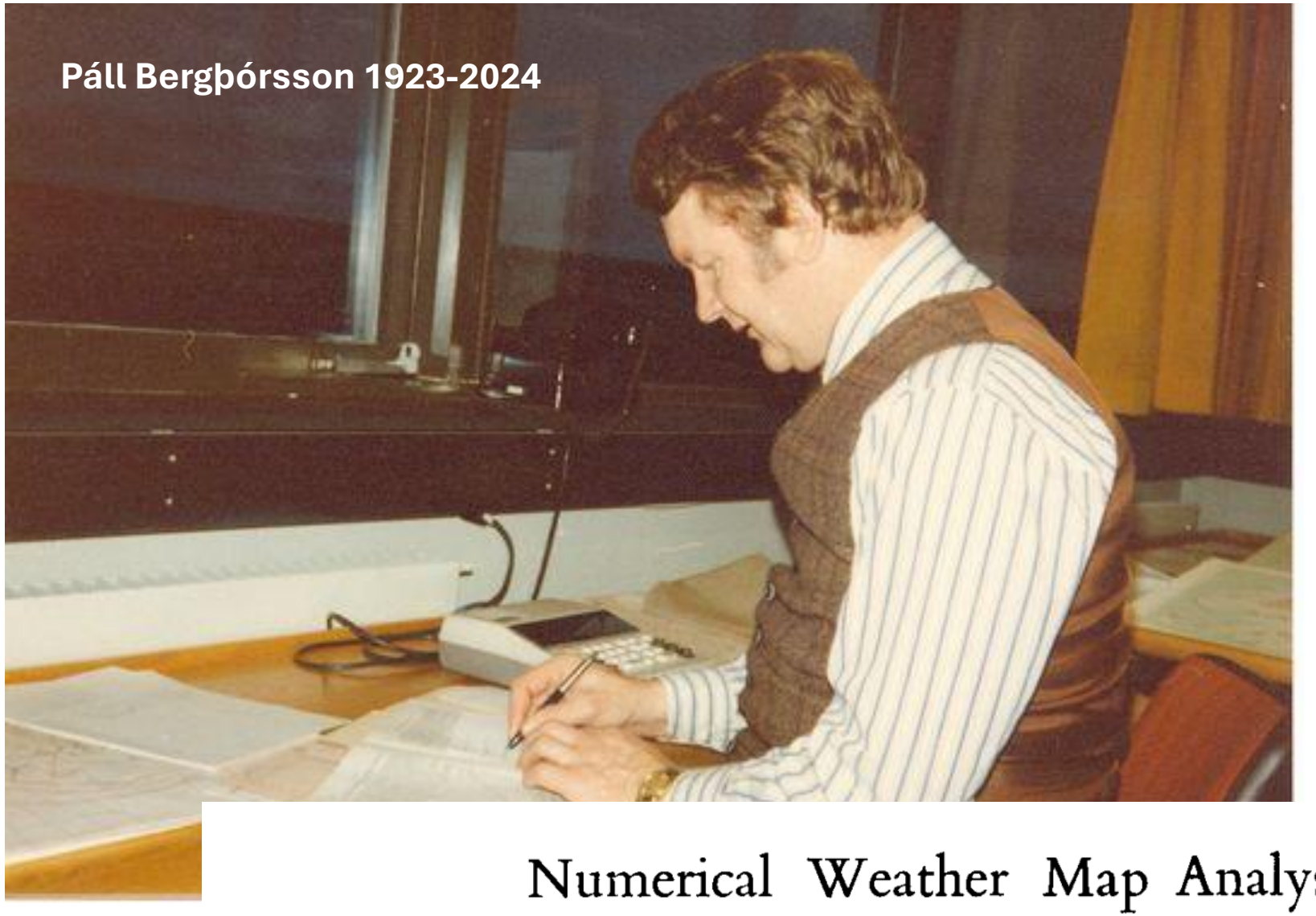


Greiningargreinin 70 ára

1955-2025

Numerical Weather Map Analysis[1]

By PÁLL BERGTHÓRSSON[2] and BO R. DÖÖS, University of Stockholm

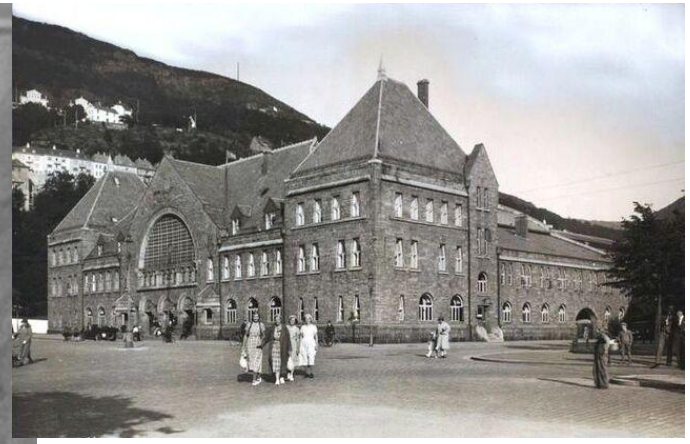
(Manuscript received June 30, 1955)

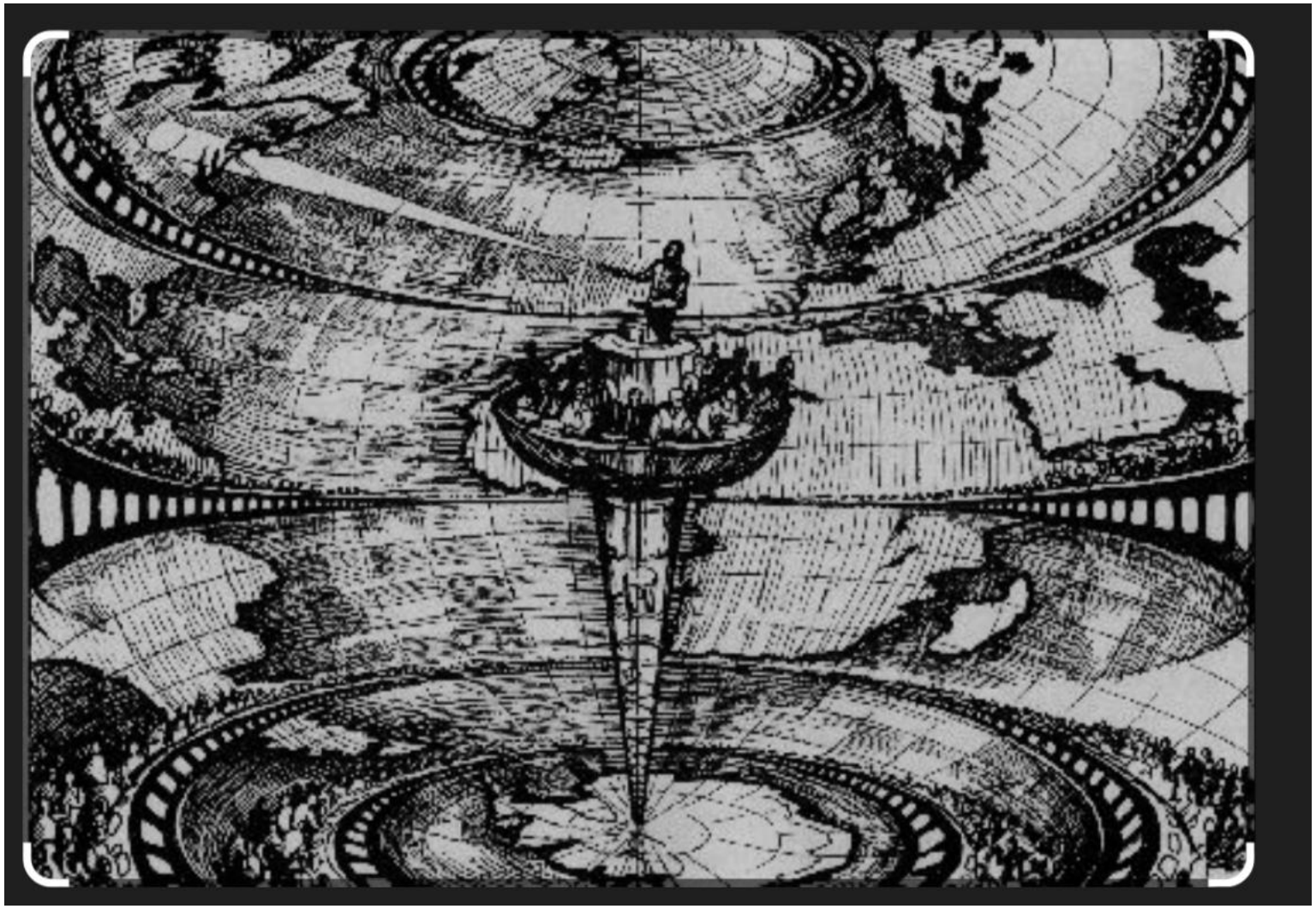
Das Problem der Wettervorhersage, betrachtet vom Standpunkte der Mechanik und der Physik.

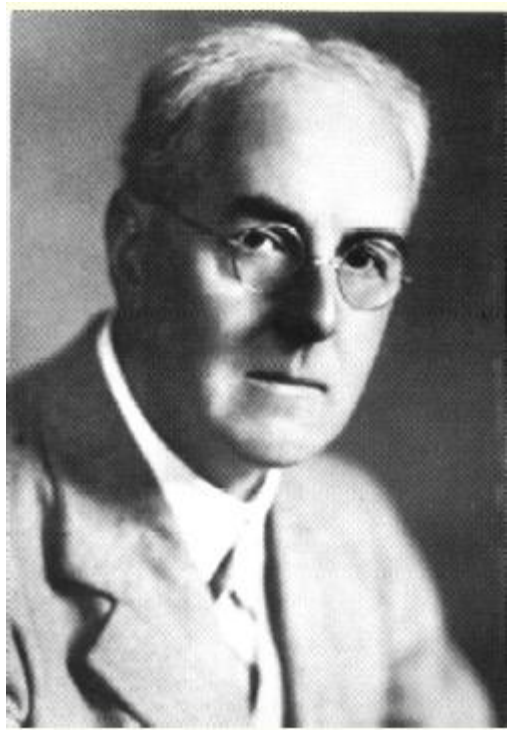
Von V. Bjerknes, Universität Stockholm.

Vilhelm Bjerknes, 1904 : Das Problem der Wettervorhersage, betrachtet vom Standpunkte der Mechanik und der Physik. Skrifað í Stokkhólmi

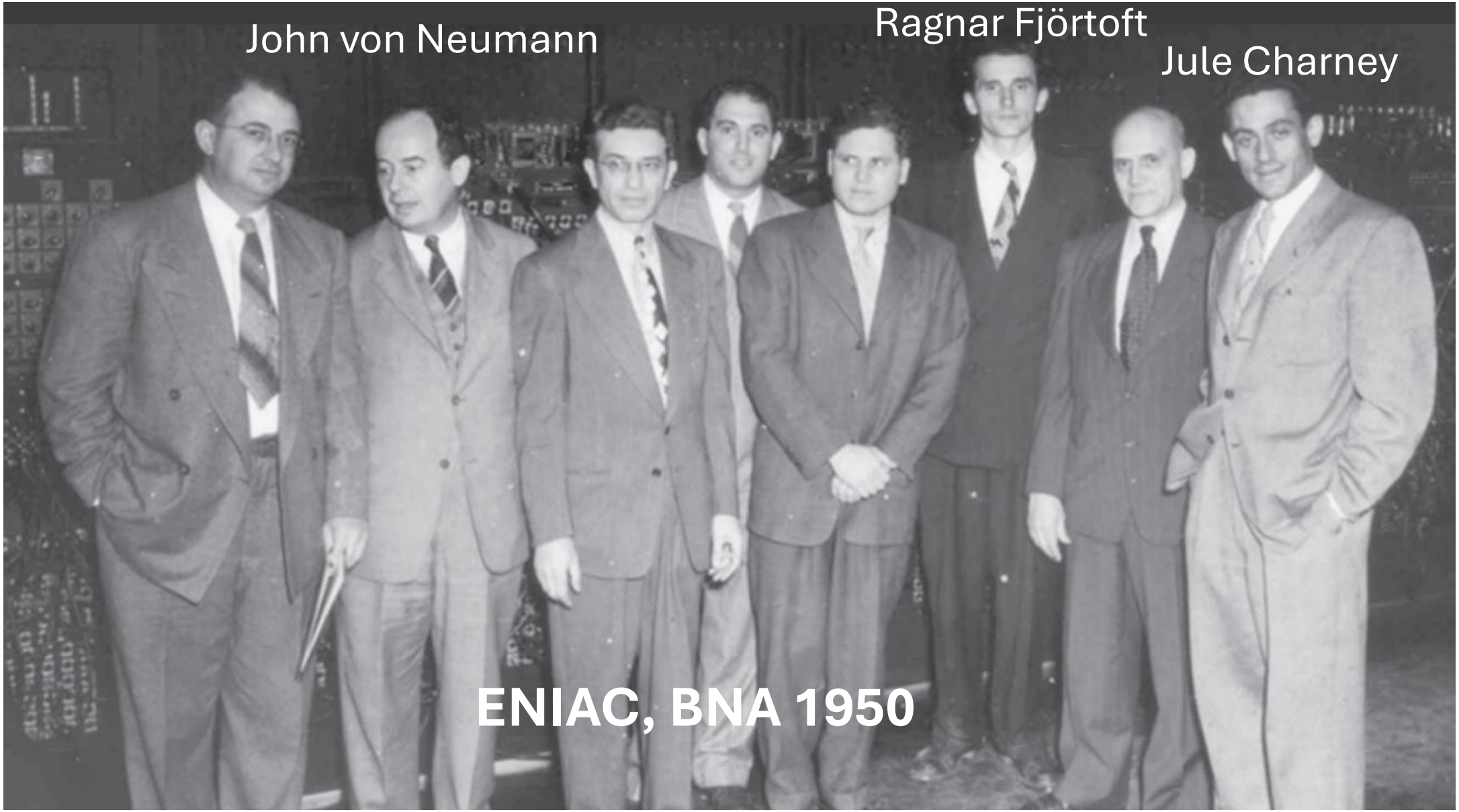
Bergenskólinn, um 1917



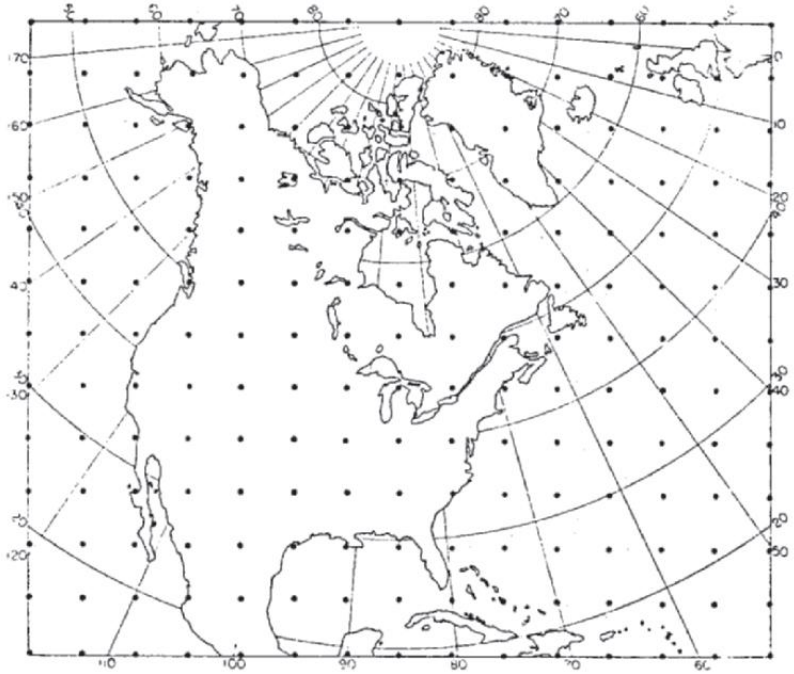




Lewis Fry Richardson, 1922: The forecast factory. Grunnjöfnurnar leystar!


John von Neumann
Ragnar Fjörtoft
Jule Charney
ENIAC, BNA 1950

Varðveisla iðu í óriðnu lofti



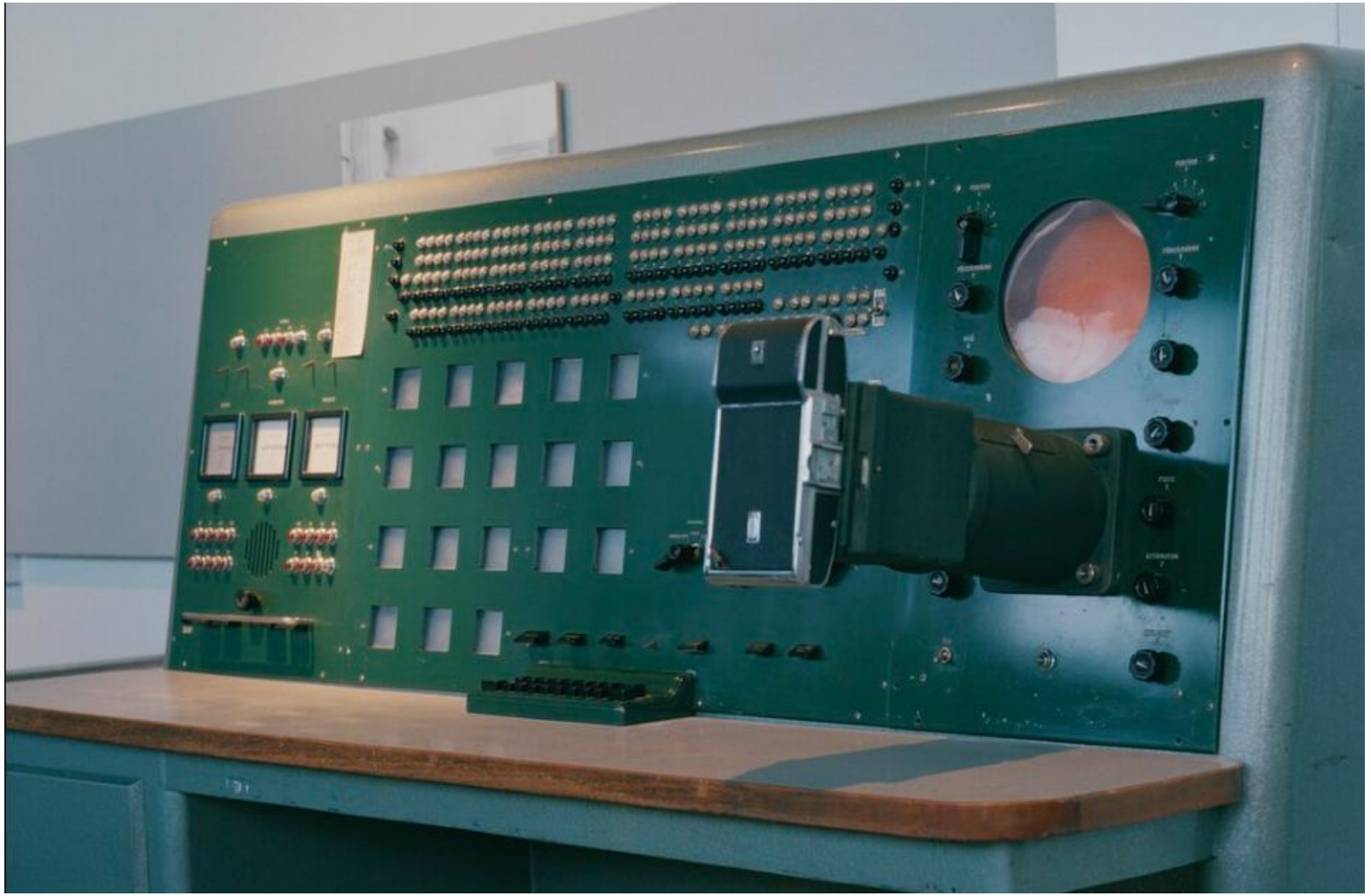
barotropic vorticity

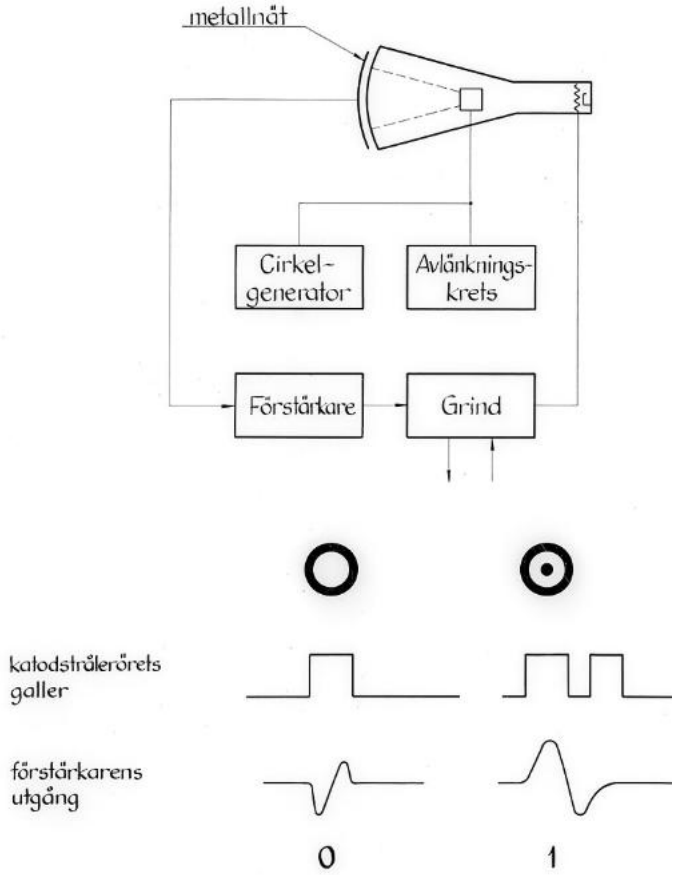
equation,

$$\frac{d(\zeta + f)}{dt} = \frac{\partial \zeta}{\partial t} + \mathbf{V} \cdot \nabla(\zeta + f) = 0, \qquad \text{(A1)}$$

Carl-Gustav Rossby

Stokkhólmur, um 1950





BESK (*Binär Elektronisk SekvensKalkylator*)

Numerical Weather Map Analysis[1]

By PÁLL BERGTHÓRSSON[2] and BO R. DÖÖS, University of Stockholm

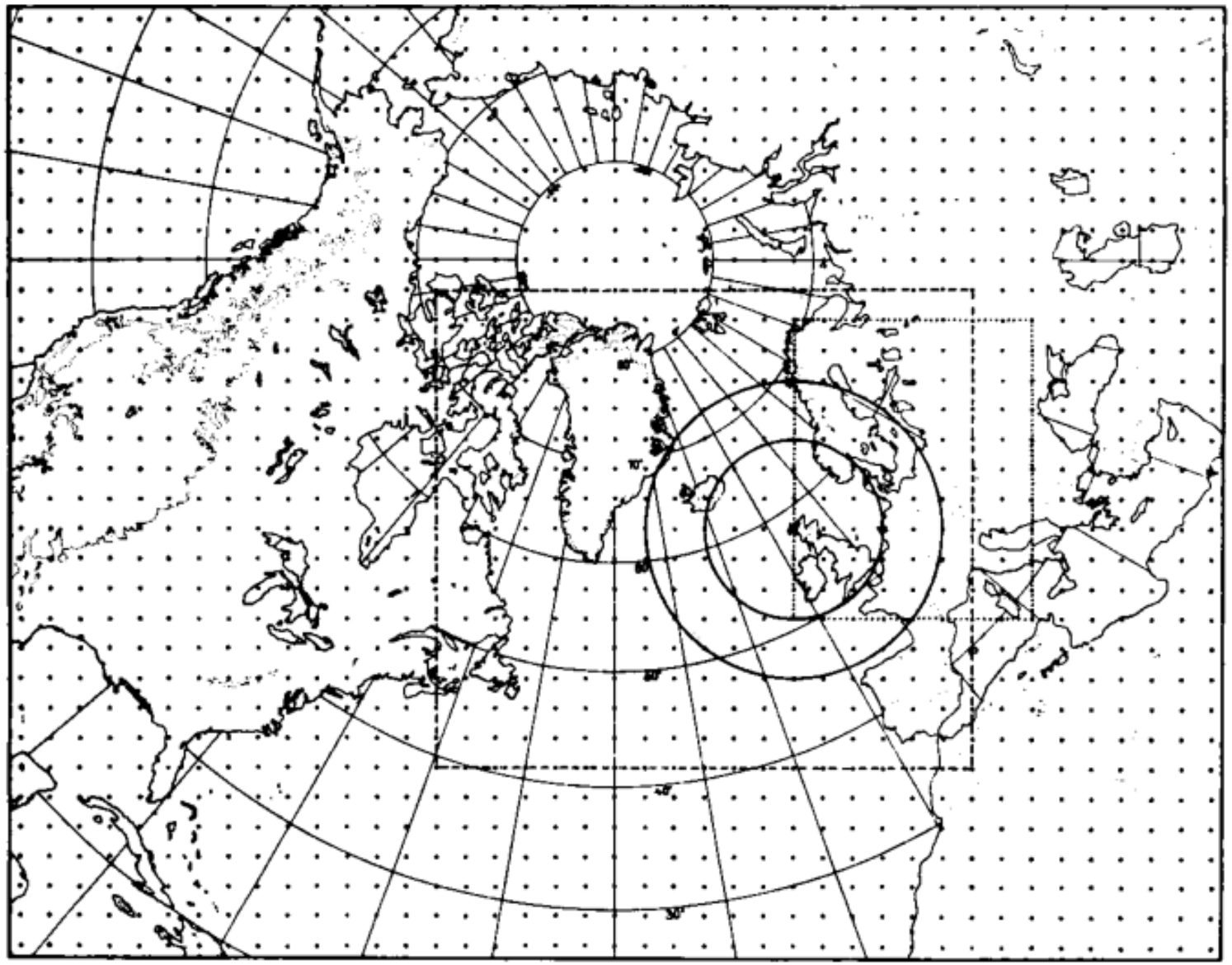
(Manuscript received June 30, 1955)

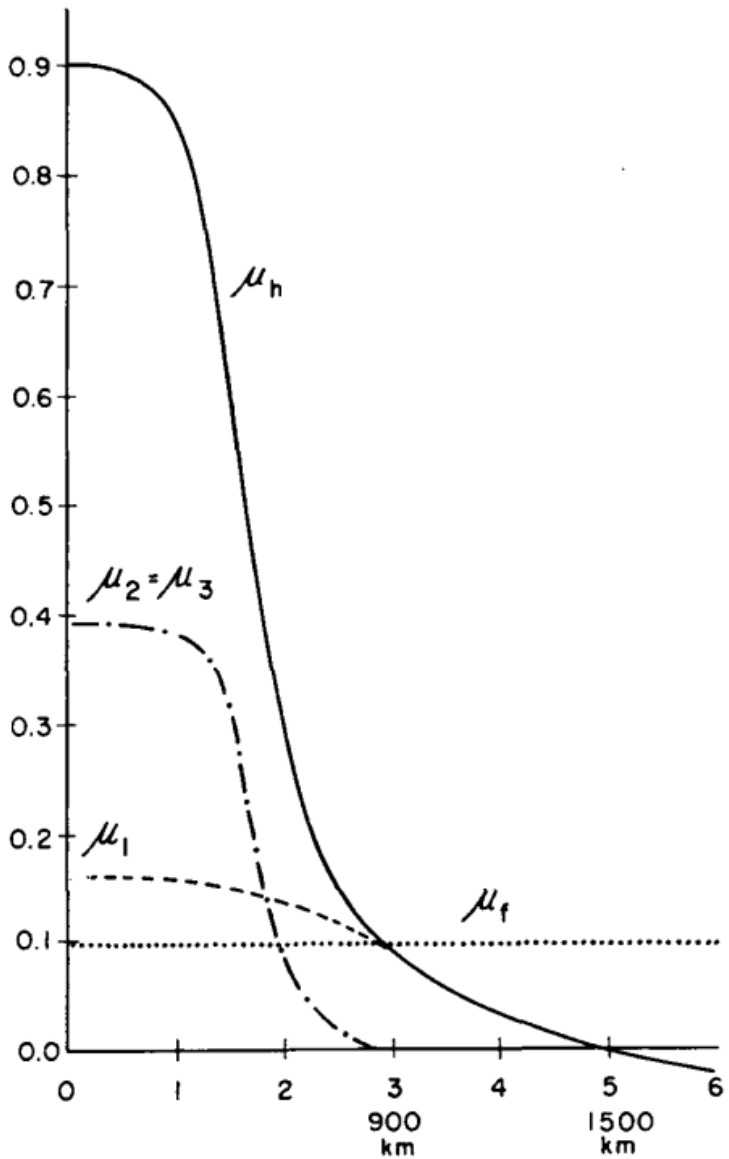
Abstract

A method to analyze upper air charts numerically is presented. The analysis is expressed by the height values of the pressure surface in gridpoints. The computed height in a gridpoint is obtained as a weighted mean of height values derived from the surrounding height and wind observations, the forecast height in the point and the corresponding normal height. Nine 500 mb maps are analyzed with the aid of the Swedish computor BESK, six of these consecutive. The size of the grid was 32×41 points.

The analyses have been compared with two independent conventional analyses. The mean values of the root mean square of the differences between the numerical and the conventional analyses were 26 m and 24 m respectively and 26 m between the two conventional ones.

The root mean square of the differences between the observed and analyzed heights was 22 m in the mean. This is roughly what should be expected judging from the existing knowledge about observation errors.





between Z_g and the conventionally analyzed height shall be a minimum for a great number of cases. This will determine the ratio between the coefficients μ_1, μ_2, μ_3 and μ_f. Since μ_f is assumed to be known from the special investigation of forecast errors this will give μ_1, μ_2 and μ_3. This computation can then be repeated for different distances from the station and thus determines the weighting functions μ_1, μ_2 and μ_3. This investigation gave the result that these weighting factors can be approximated by the following expressions:

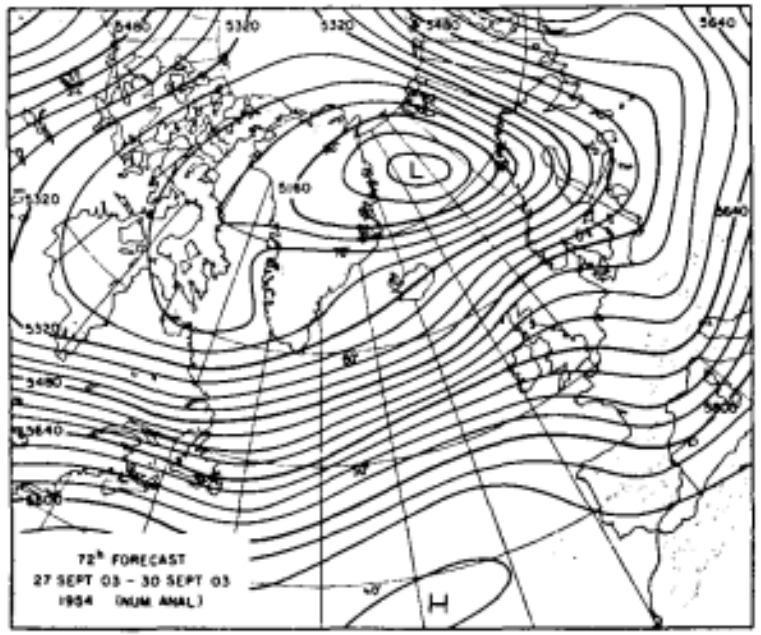
$$\mu_1 = \frac{30}{r^4 + 150} - 0.04 \tag{8}$$

$$\mu_2 = \mu_3 = \frac{27}{r^8 + 70} \tag{9}$$

where r is given in gridunits. Having modified the preliminary height in one point by one such station we have

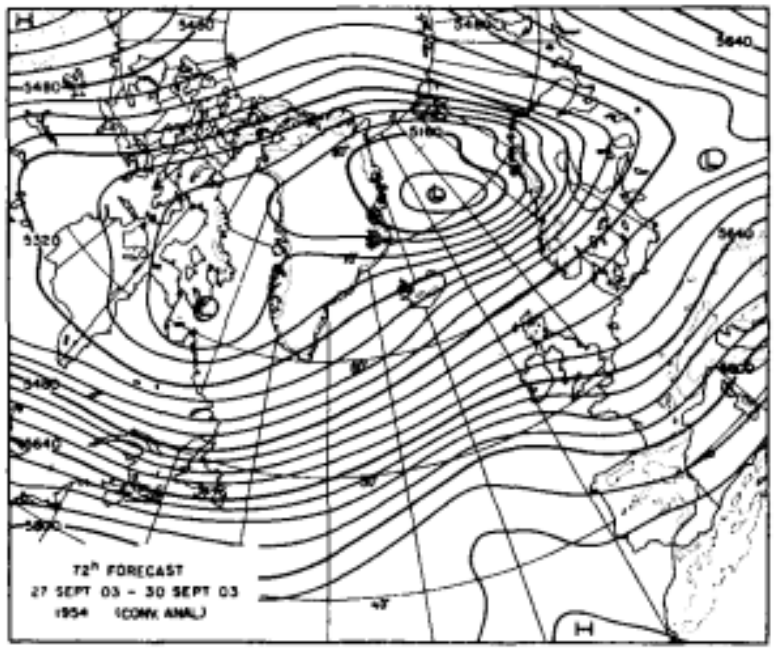
$$Z_g = \frac{\mu_f Z_f + \mu_N Z_N + \mu_1 Z_1 + \mu_2 Z_2 + \mu_3 Z_3}{\mu_f + \mu_N + \mu_1 + \mu_2 + \mu_3} \tag{10}$$

In the case where the station reports height only or if it is so far from the gridpoint, that the wind is of no value as an information (beyond ca 900 km) we only use assumption 1) which was discussed above in connection with



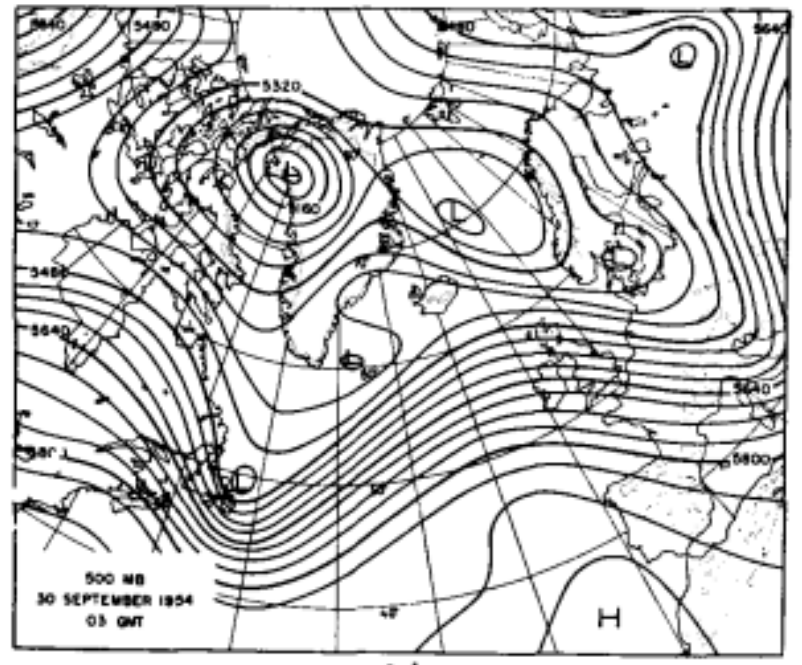
8 b

Spá með vélgreiningu



8 c

Spá með handunninni greiningu



8 d

Lausnin

there seems to be no significant difference between the goodness of the forecasts based on our analyses and the conventional analyses.

Veðráttan 1958

Norska veðurstofan hafði boðið Páli Bergþórssyni starf um stundarsakir vegna jarðeðlisfræðiársins, og starfaði hann þar síðustu þrjá mánuði ársins. Féllst dr. Ragnar Fjörtoft, veðurstofustjóri, góðfúslega á, að Páll ynni að undirbúningi þess, að teknar yrðu upp á Veðurstofu Íslands spár fyrir meira en einn sólarhring fram í tímann. Komst hann að þeirri niðurstöðu, að slíka spá, 48 klst. fram í tímann, gæti einn veðurfræðingur gert með teikniaðferð og lokið henni á 2—3 klst., þó að byggt væri á sömu lögmálum og notuð eru við spár með rafeindareiknivélum. Að sjálfsögðu yrði þá að nota lögmálin í mun einfaldari mynd. Þó má á þennan hátt taka verulegt tillit til þeirra áhrifa, sem Grænland hefur á loftstrauma í grennd við Ísland.

Í tímaritinu Tellus, sem gefið er út af sænska jarðeðlisfræðifélaginu, birtist árið 1957, grein eftir Hlyn Sigtryggsson og A. Wiin-Nielsen um rannsóknir þeirra á vegum Stokkhólmsháskóla.

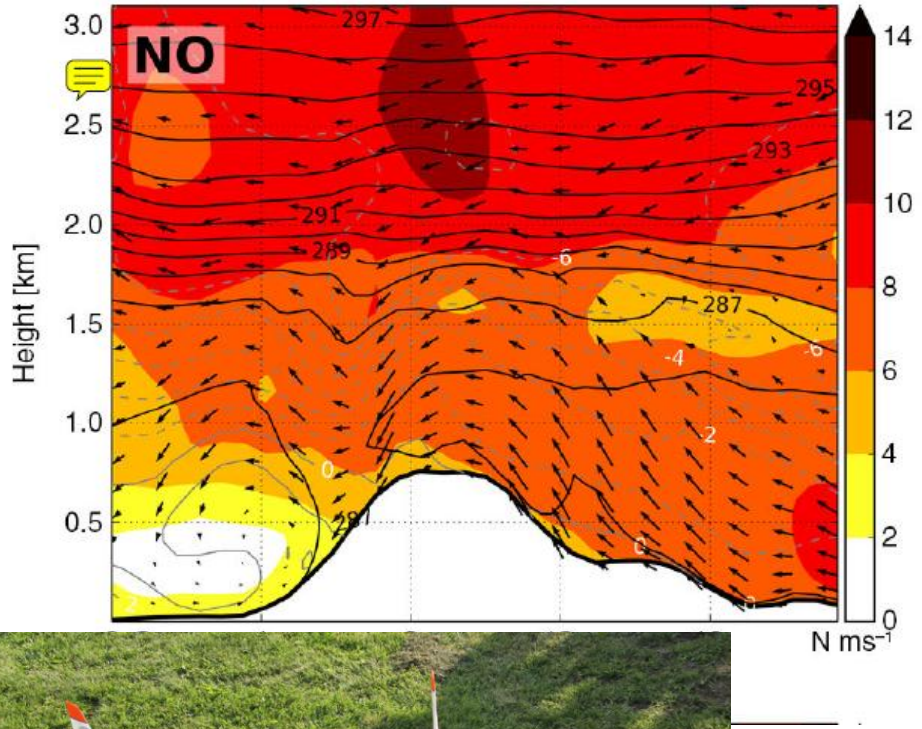
Að skrifa sig inn í söguna

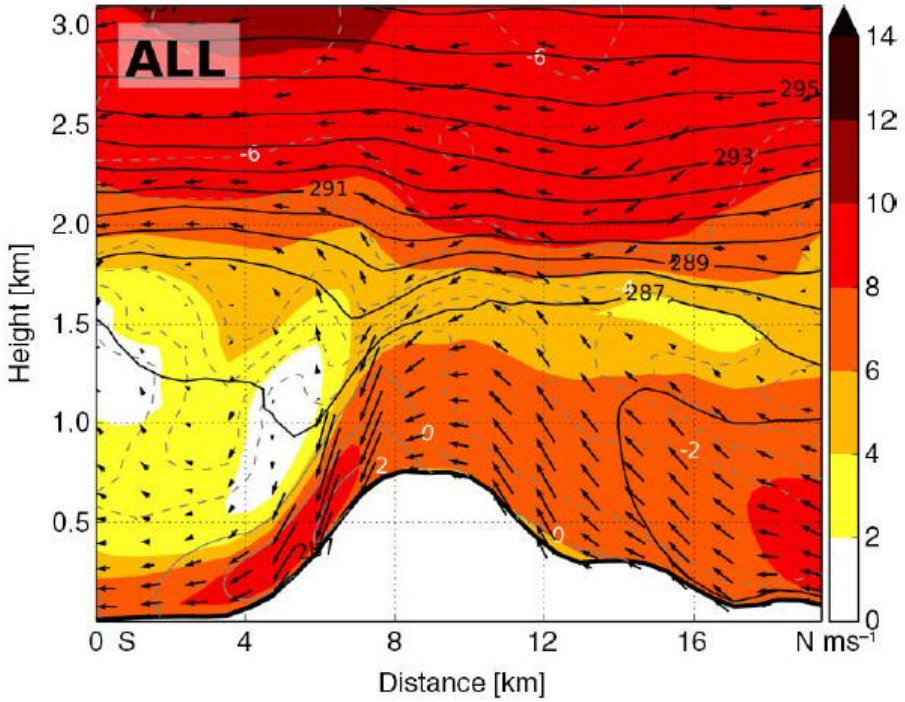
Fisvélar

Height [km]

Ag
Tellus, 2014

Esja í norðanátt





Tellus, 2014
Mon Wea. Rev., 2013
Q. J. Roy. Meteorol. Soc., 2014

Tellus A: Dynamic Meteorology and Oceanography

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The impact of assimilating data from a remotely piloted aircraft on simulations of weak-wind orographic flow

Hálfdán Ágústsson, Haraldur Ólafsson, Marius O. Jonassen & ólafur Rögnvaldsson

VERSITA

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DOI: 10.2478/s11600-012-0042-8

The Small Unmanned Meteorological Observer SUMO: Recent Developments and Applications of a Micro-UAS for Atmospheric Boundary Layer Research

Joachim REUDER, Marius O. JONASSEN,
and Haraldur ÓLAFSSON

DOI: 10.1175/MWR-D-11-00344.1 • Corpus ID: 119773078

Improving High-Resolution Numerical Weather Simulations by Assimilating Data from an Unmanned Aerial System

M. Jonassen, H. Ólafsson, H. Ágústsson, Ó. Rögnvaldsson, J. Reuder less • Published 1 November 2012 •
Environmental Science, Engineering • Monthly Weather Review


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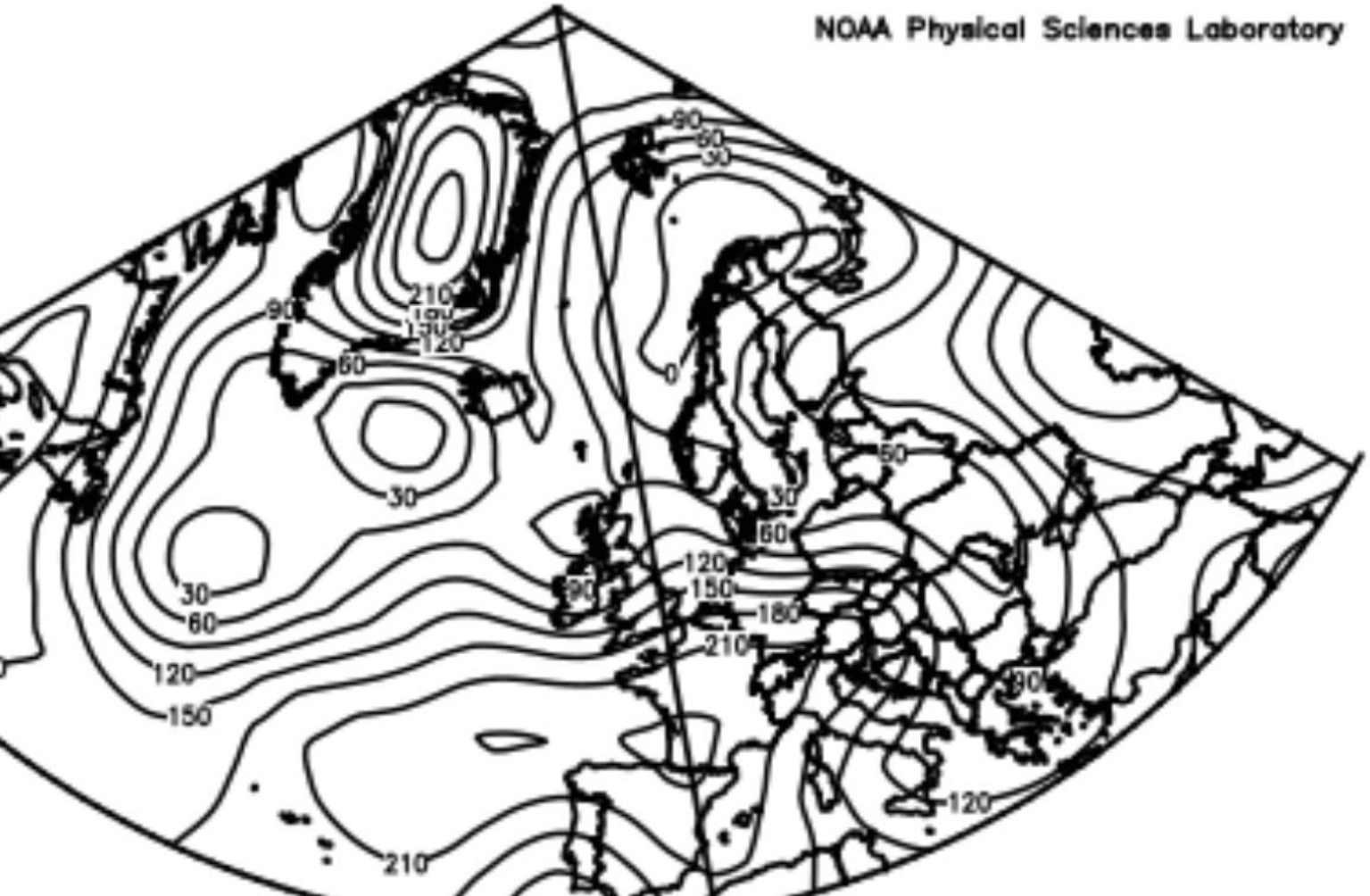

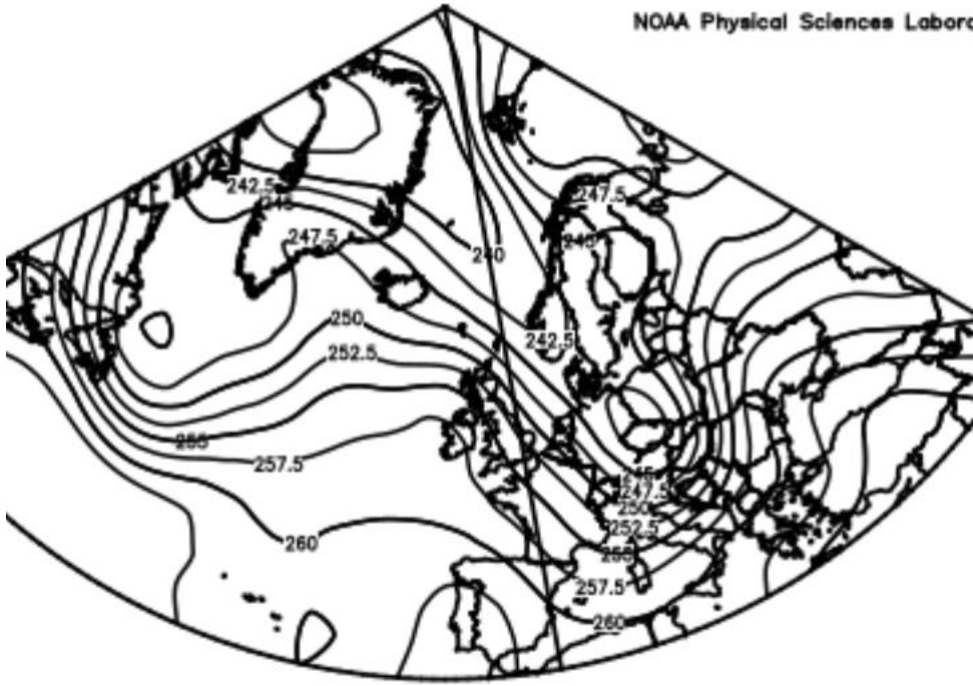

500mb Temperatures (K) Composite Mean
09/30/54 6z

Search