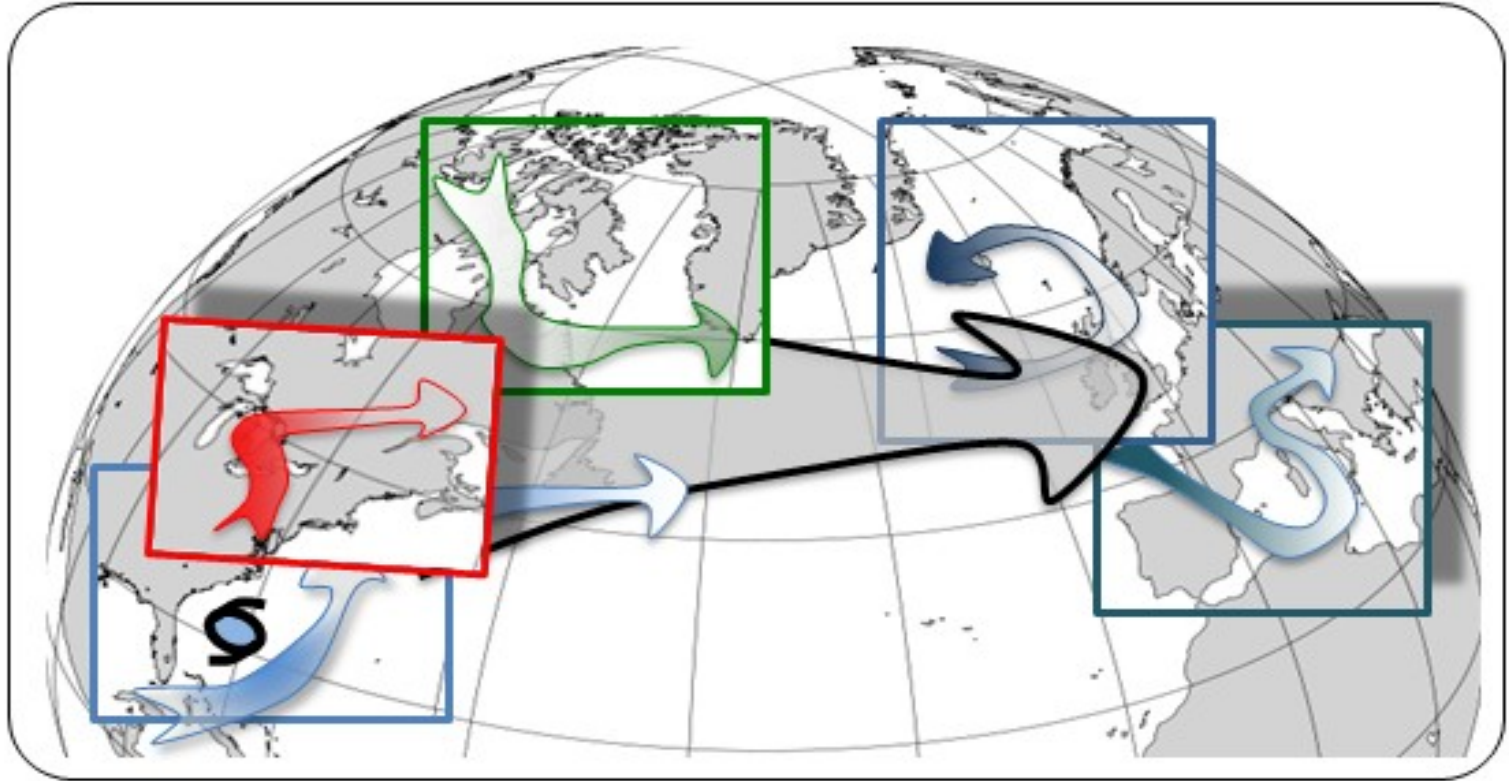


NAWDEX – General Planning Meeting

06 October 2016, Keflavik 11 UTC



NAWDEX – General Planning Meeting

06 October 2016, Keflavik 11 UTC

Key issues today

1. Friday flights HALO, DLR-Falcon, Safire
2. Saturday flight for Falcon?
3. Sunday flight for Halo and/or Falcon?
4. Outlook
 - Mon/Tue: Radiometer intercomparison, Halo, Safire, FAAM) ?

NAWDEX – General Planning Meeting

06 October 2016, Keflavik 11 UTC

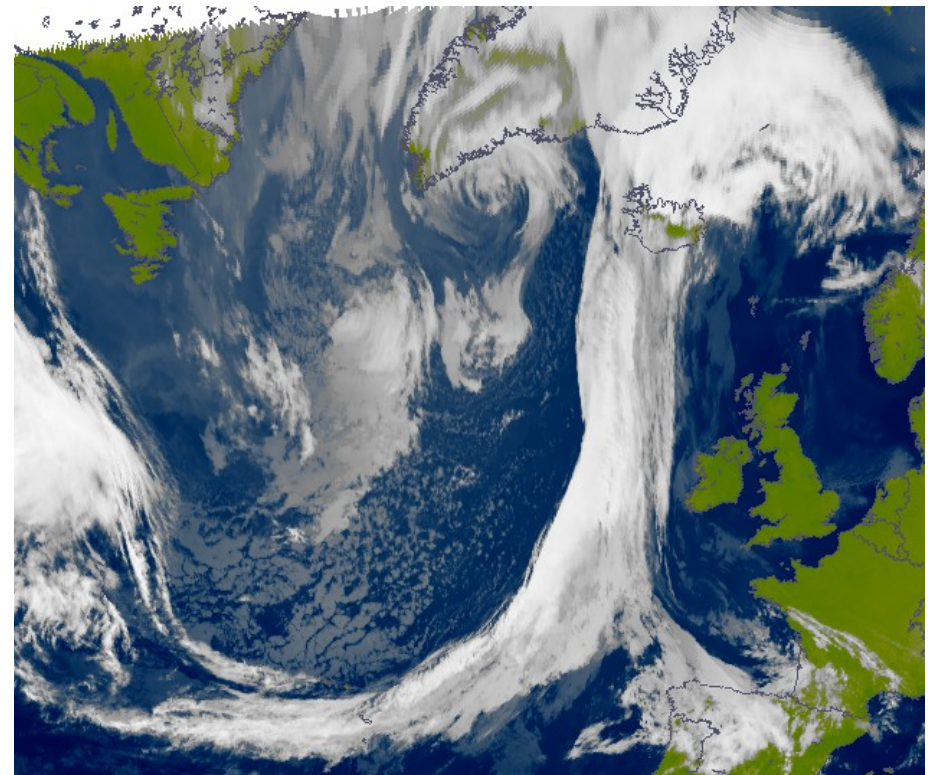
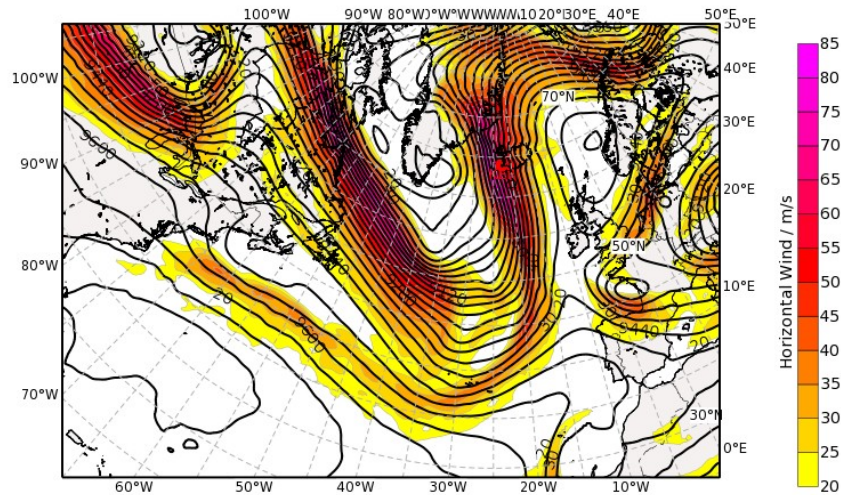
- 1.Key information from previous flight (2 minutes)
- 2.Aircraft status report by FX-Operations
- 3.Instrument status report by Instrument Manager
- 4.Short weather summary: information about flight options for the next days and update for planning for the next day with the latest forecast
- 5.Final discussion about flight pattern for next day (in case of 2 options)
- 6.Report of Ground-Based Observation coordinator
- 7.Announcement of tentative plans for Day+3
- 8.Coordination with other aircraft (Input from other groups)

Weather Summary

Analysis – 06 Oct 2016, 00 UTC

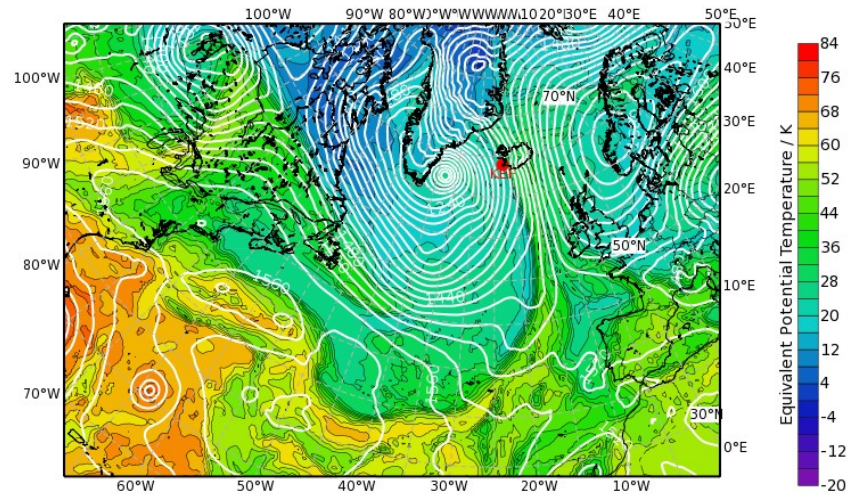
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa

Valid: Thu, 06 Oct 2016, 00 UTC (step 000 h from Thu, 06 Oct 2016, 00 UTC)



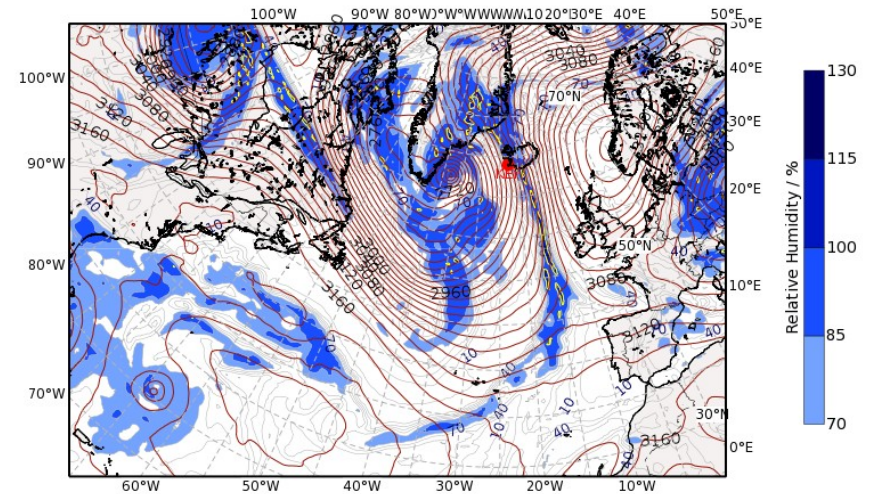
Equivalent Potential Temperature (degC) & Streamlines at 850 hPa

Valid: Thu, 06 Oct 2016, 00 UTC (step 000 h from Thu, 06 Oct 2016, 00 UTC)



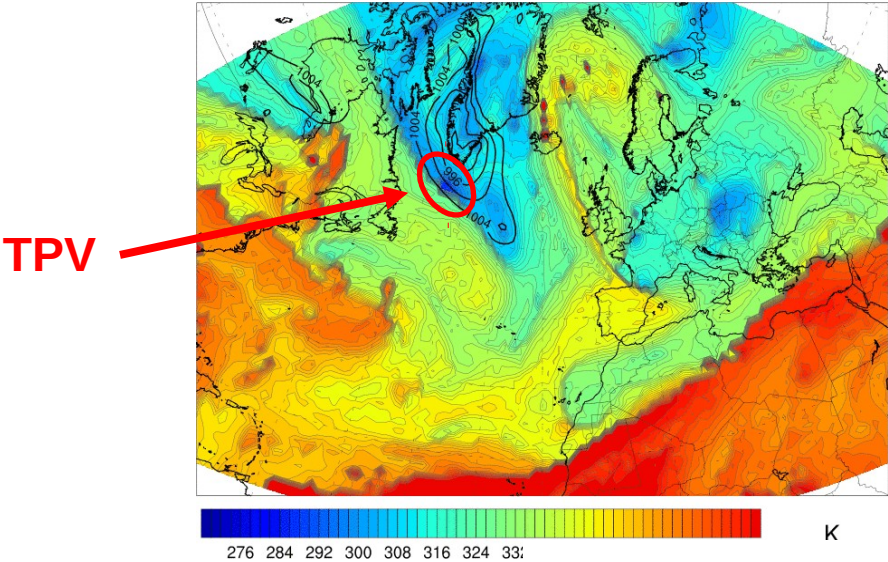
Relative Humidity (%) and Z (m) at 700 hPa

Valid: Thu, 06 Oct 2016, 00 UTC (step 000 h from Thu, 06 Oct 2016, 00 UTC)

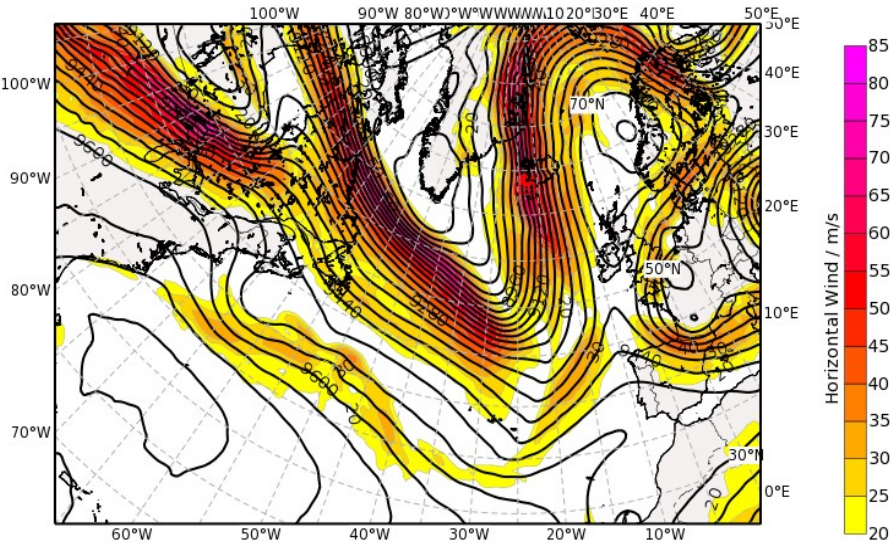


Forecast – Thu 06 Oct 2016, 12 UTC

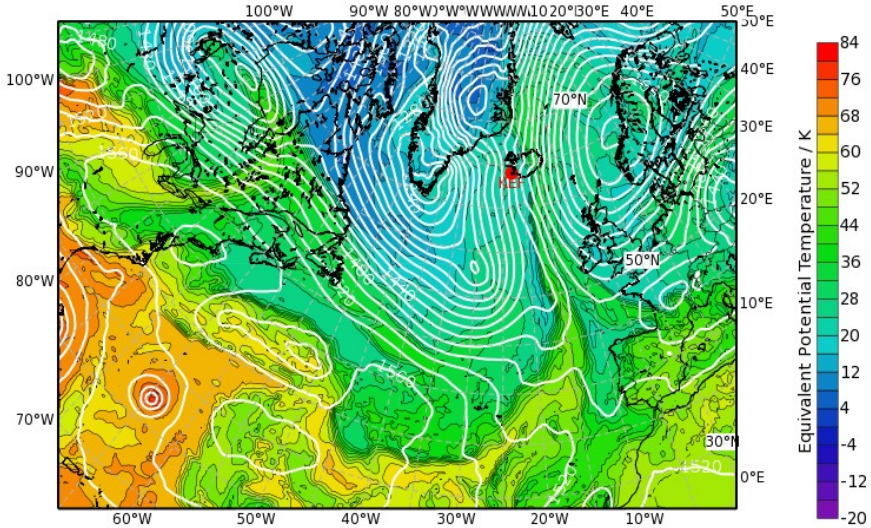
TH-2PVU, Z300, THE850
BT0600



Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Thu, 06 Oct 2016, 12 UTC (step 012 h from Thu, 06 Oct 2016, 00 UTC)

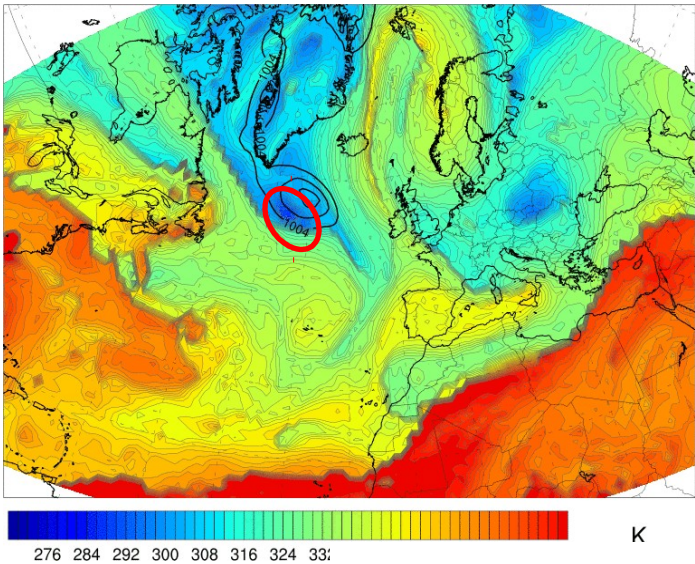


Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Thu, 06 Oct 2016, 12 UTC (step 012 h from Thu, 06 Oct 2016, 00 UTC)



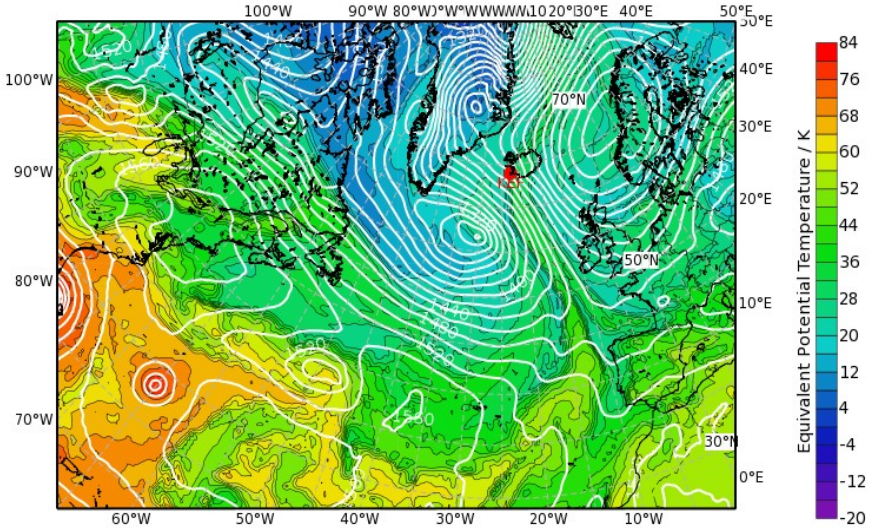
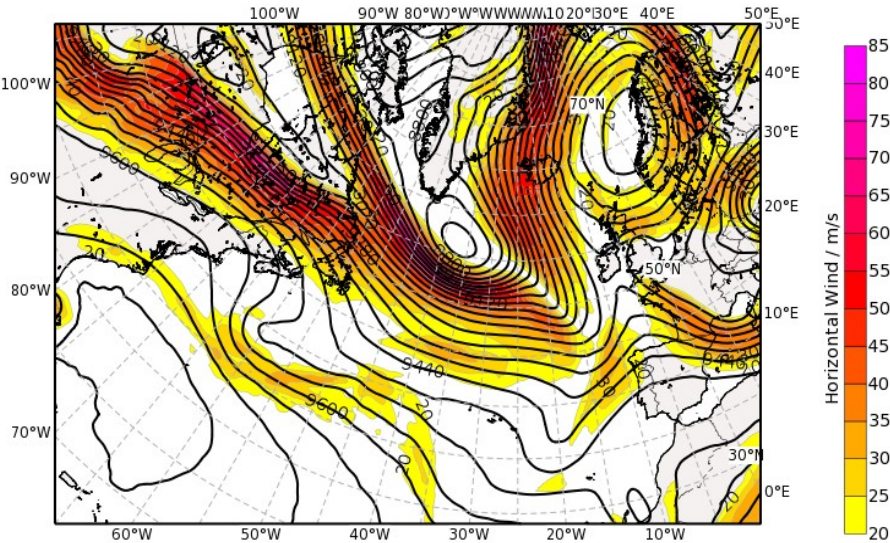
Forecast – Fri 07 Oct 2016, 00 UTC

TH-2PVU, Z300, THE850
BT0600



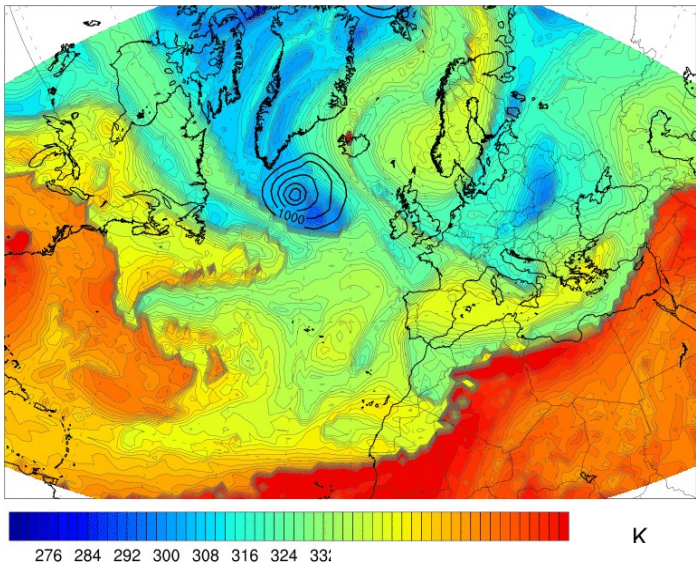
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Fri, 07 Oct 2016, 00 UTC (step 024 h from Thu, 06 Oct 2016, 00 UTC)

Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Fri, 07 Oct 2016, 00 UTC (step 024 h from Thu, 06 Oct 2016, 00 UTC)

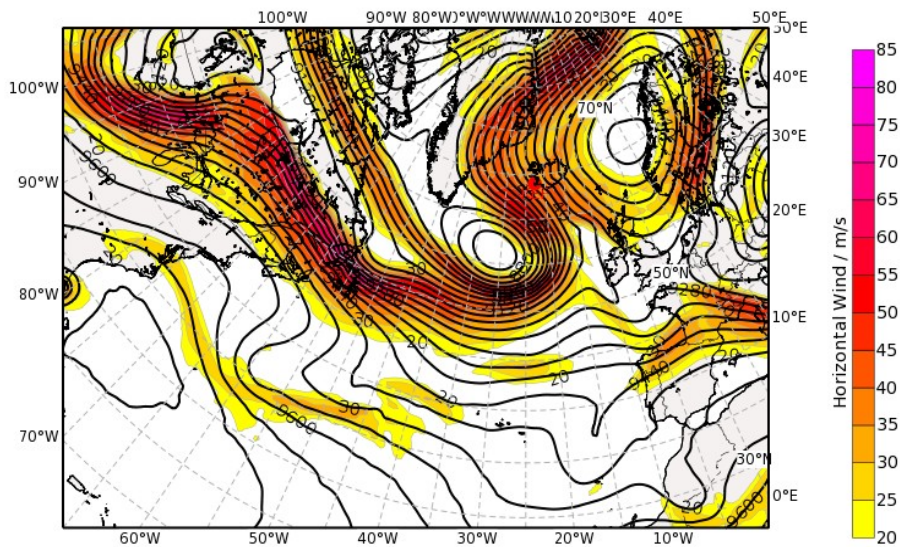


Forecast – Fri 07 Oct 2016, 12 UTC

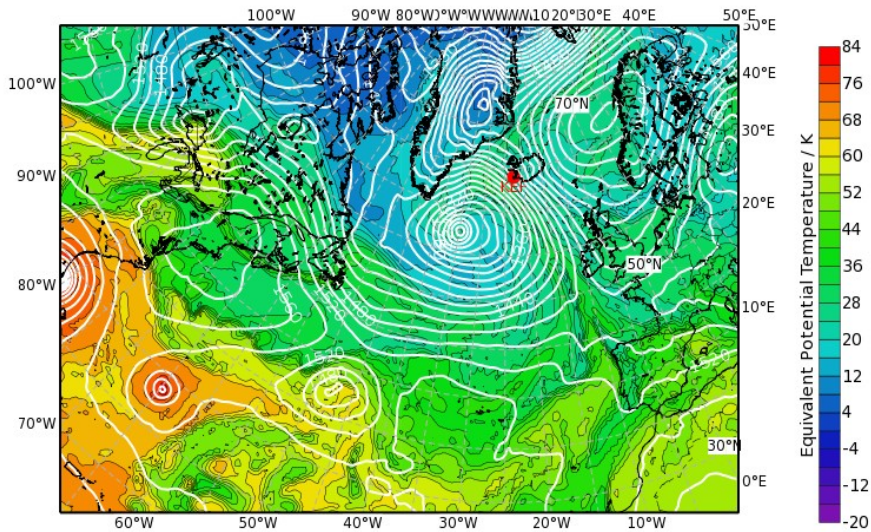
TH-2PVU, Z300, THE850
BT0600



Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Fri, 07 Oct 2016, 12 UTC (step 036 h from Thu, 06 Oct 2016, 00 UTC)



Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Fri, 07 Oct 2016, 12 UTC (step 036 h from Thu, 06 Oct 2016, 00 UTC)



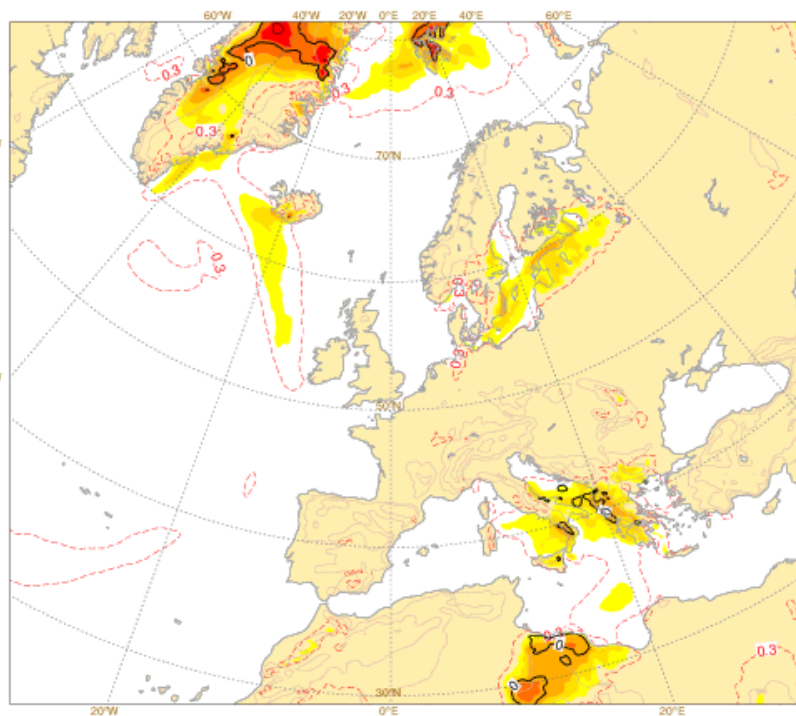
EFI gusts for Fri 07 (BT 06/00z)

ENS Meteorogram

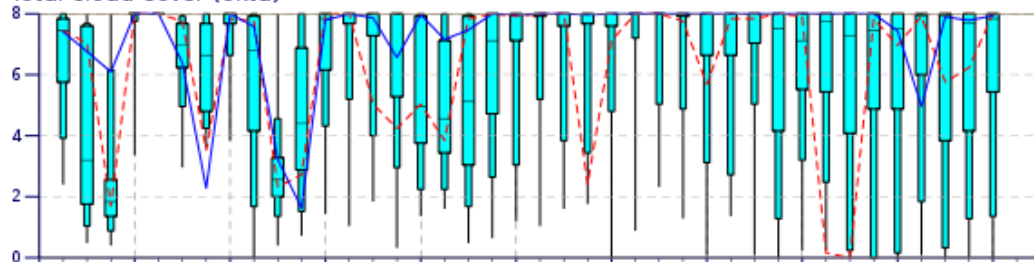
Keflavik, Iceland 63.89°N 22.26°W (ENS land point) 5 m

High Resolution Forecast and ENS Distribution Thursday 6 October 2016 00 UTC

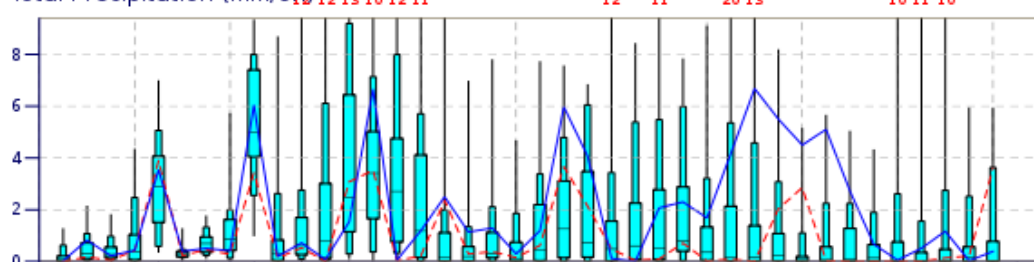
Thu 06 Oct 2016 00UTC ©ECMWF t+24-48h VT: Fri 07 Oct 2016 00UTC - Sat 08 Oct 2016 00UTC
Extreme forecast index and Shift of Tails (black contours 0,1,2,5,8) for 10m wind gusts



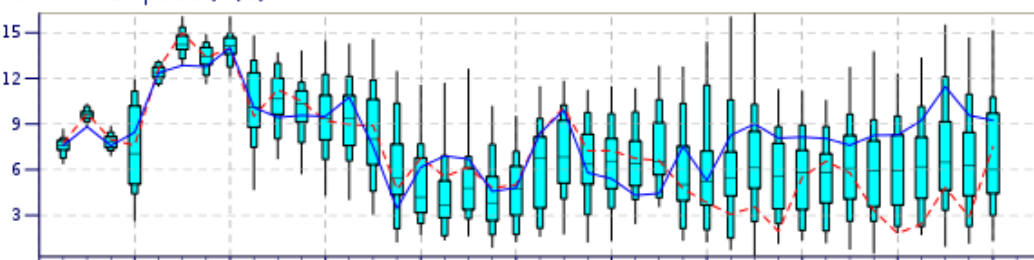
Total Cloud Cover (okta)



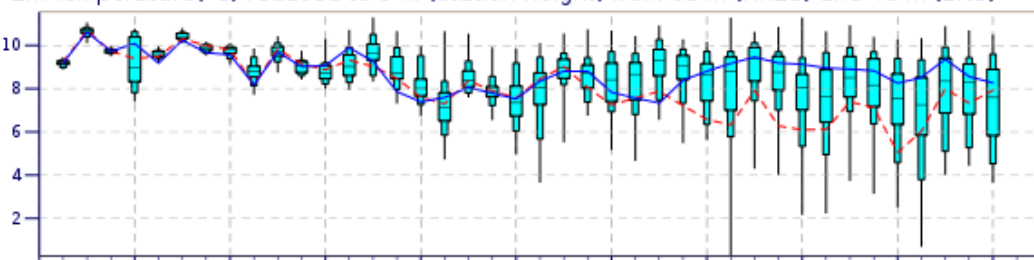
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature(°C) reduced to 5 m (station height) from 83 m (HRES) and 46 m (ENS)

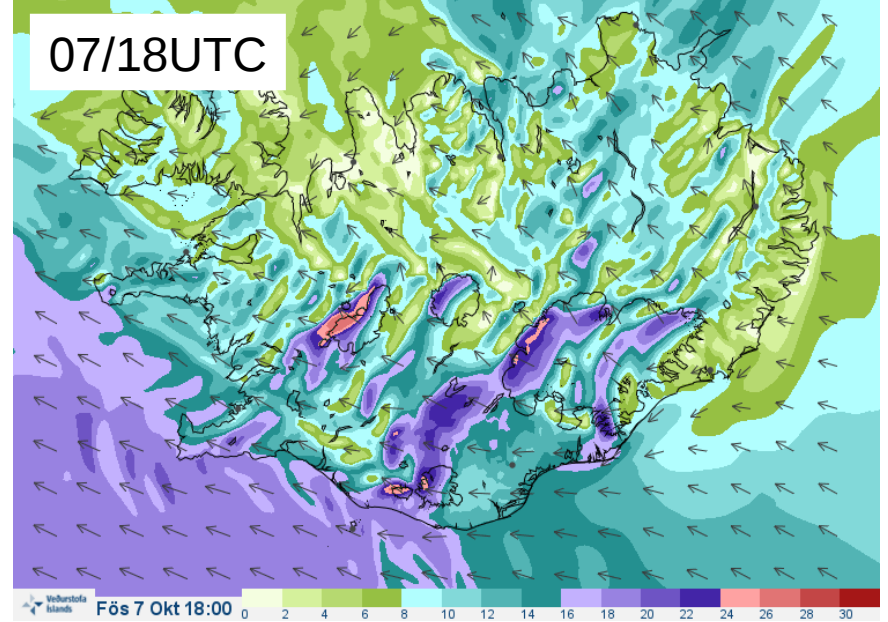
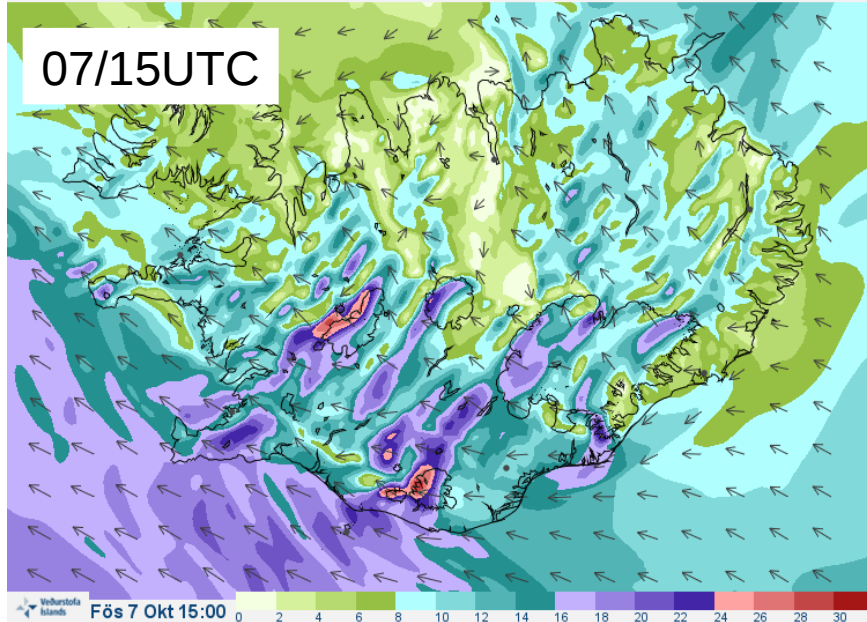
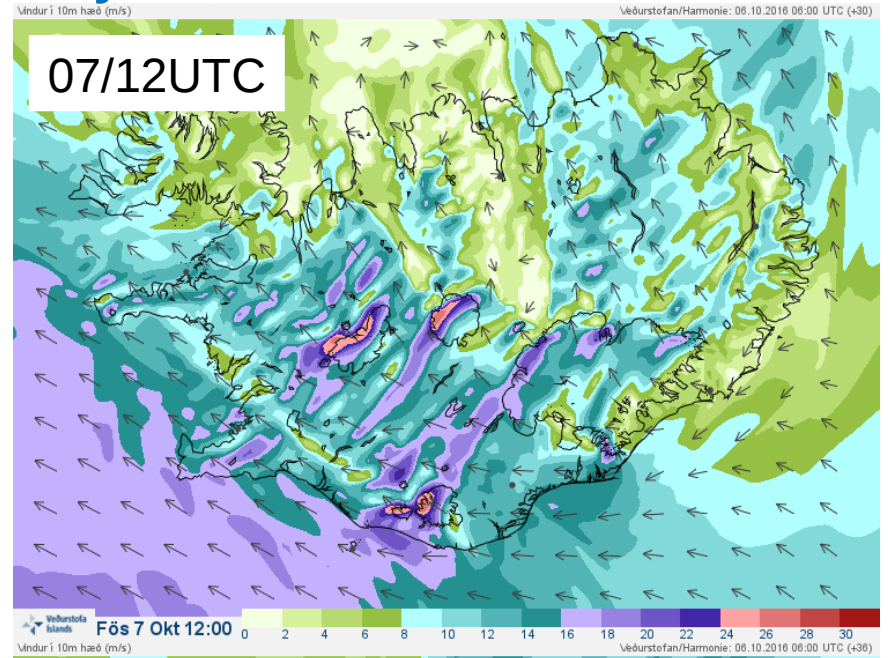
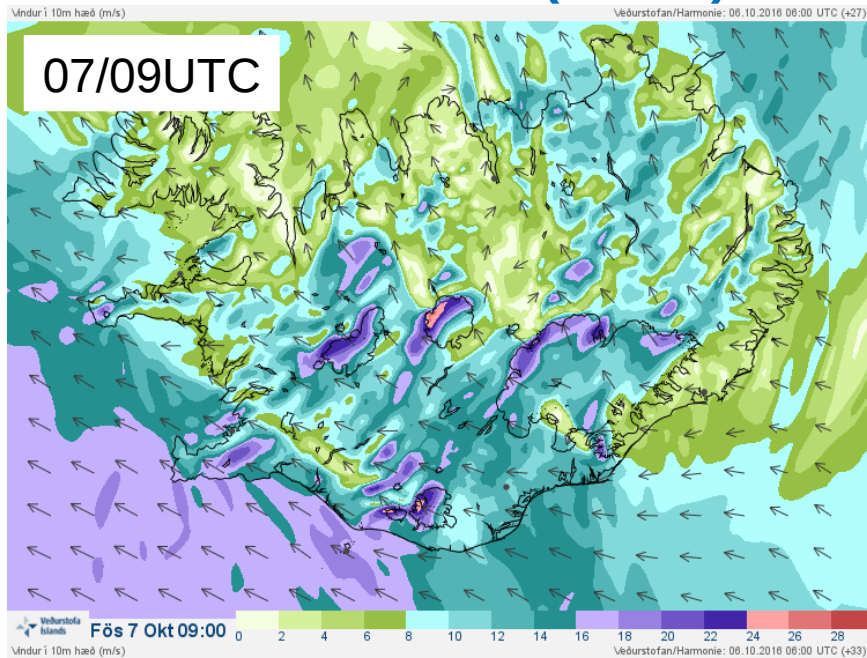


- Possibility of 15m/s wind during the whole day of Friday.

Thu 6 Oct 2016 Fri 7 Sat 8 Sun 9 Mon 10 Tue 11 Wed 12 Thu 13 Fri 14 Sat 15 Sun 16

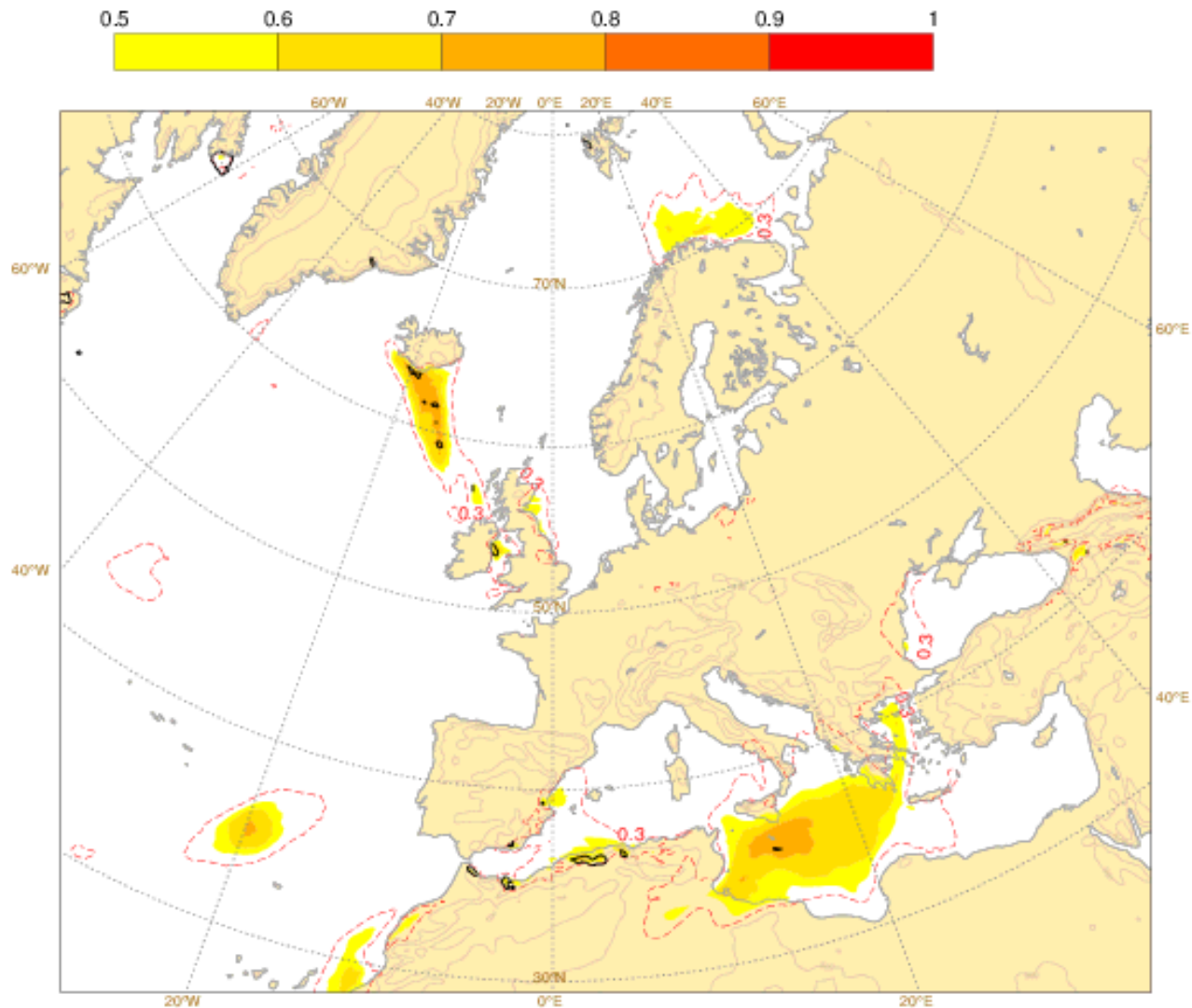
10m winds HARMONIE (2.5km) Wednesday

HARMONIE vedur.is BT 06/06Z



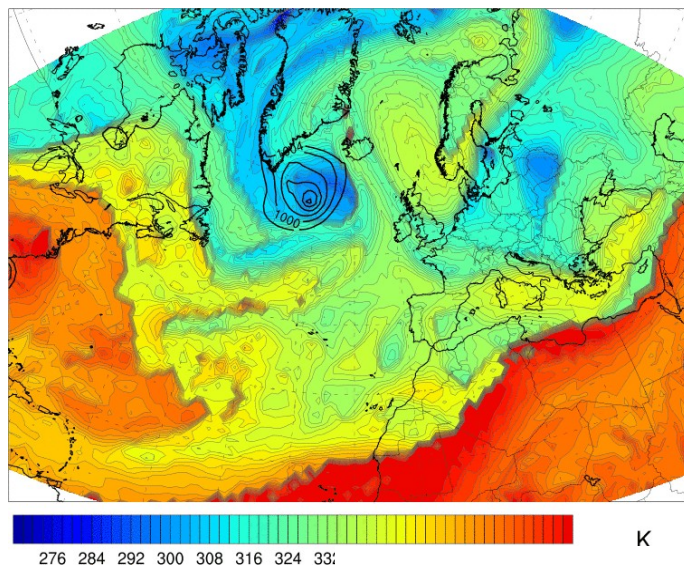
EFI for CAPE on Fri 07 (BT 06/00z)

Thu 06 Oct 2016 00UTC ©ECMWF t+24-48h VT: Fri 07 Oct 2016 00UTC - Sat 08 Oct 2016 00UTC
Extreme forecast index and Shift of Tails (black contours 0,1,2,5,8) for CAPE



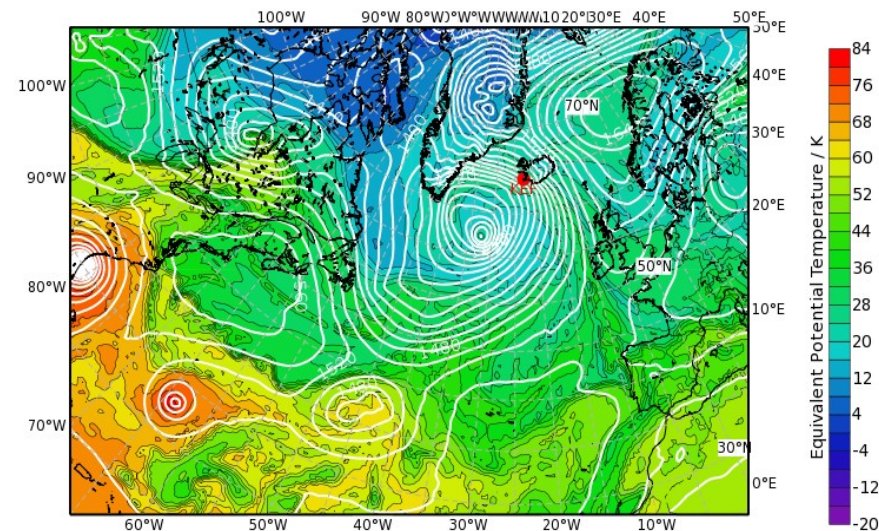
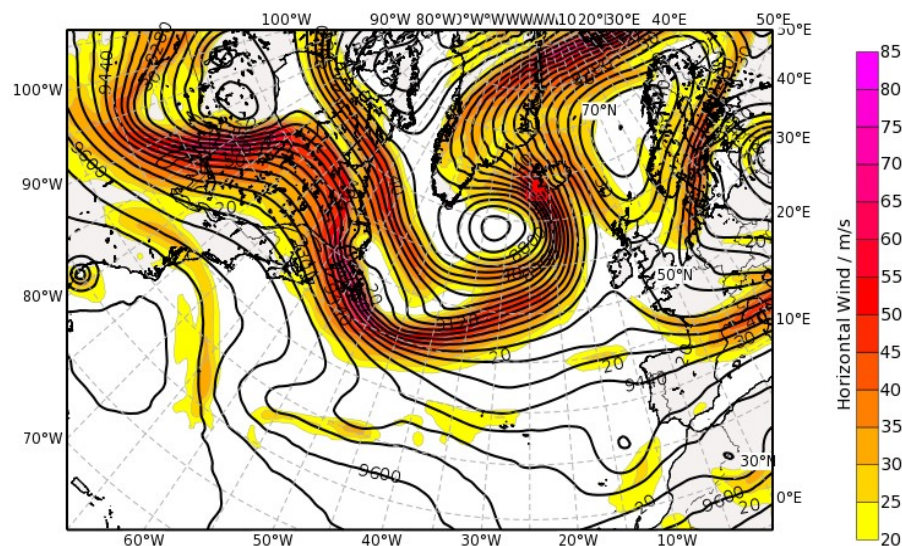
Forecast – Sat 08 Oct 2016, 00 UTC

TH-2PVU, Z300, THE850
BT0600



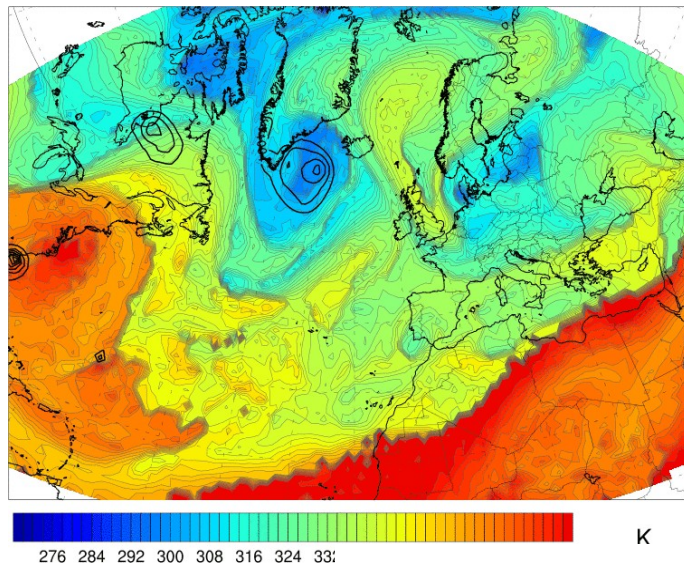
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Sat, 08 Oct 2016, 00 UTC (step 048 h from Thu, 06 Oct 2016, 00 UTC)

Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Sat, 08 Oct 2016, 00 UTC (step 048 h from Thu, 06 Oct 2016, 00 UTC)



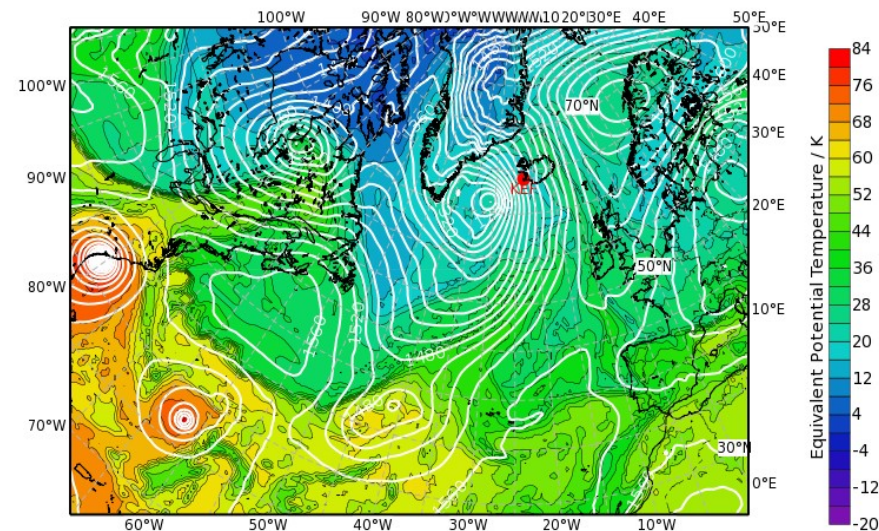
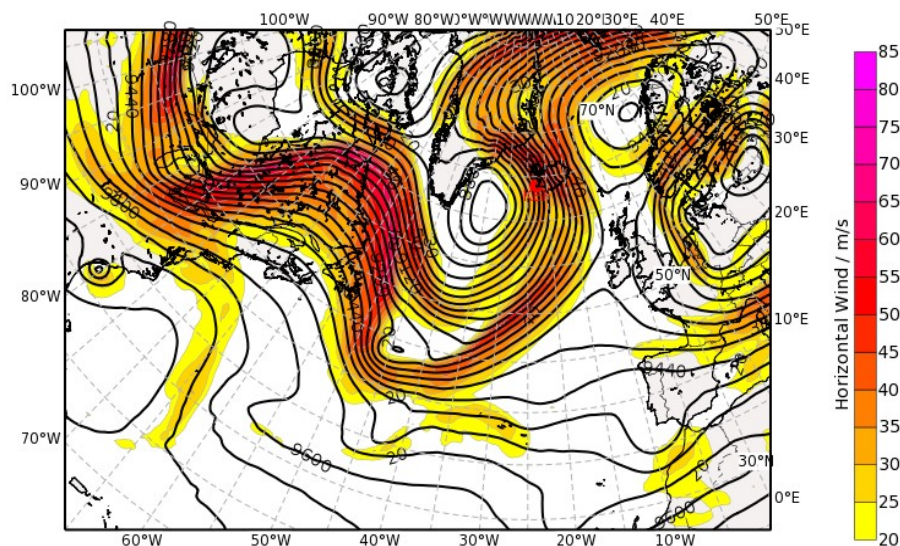
Forecast – Sat 08 Oct 2016, 12 UTC

TH-2PVU, Z300, THE850
BT0600



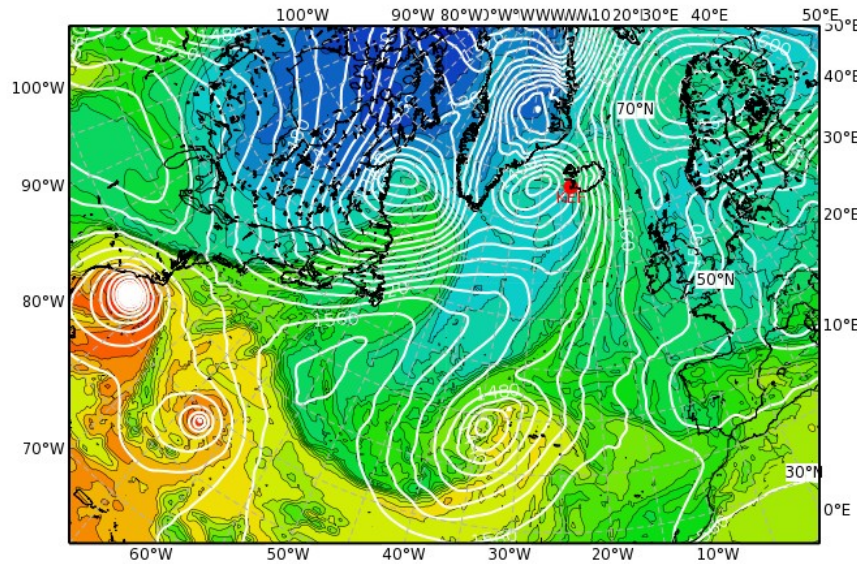
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Sat, 08 Oct 2016, 12 UTC (step 060 h from Thu, 06 Oct 2016, 00 UTC)

Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Sat, 08 Oct 2016, 12 UTC (step 060 h from Thu, 06 Oct 2016, 00 UTC)

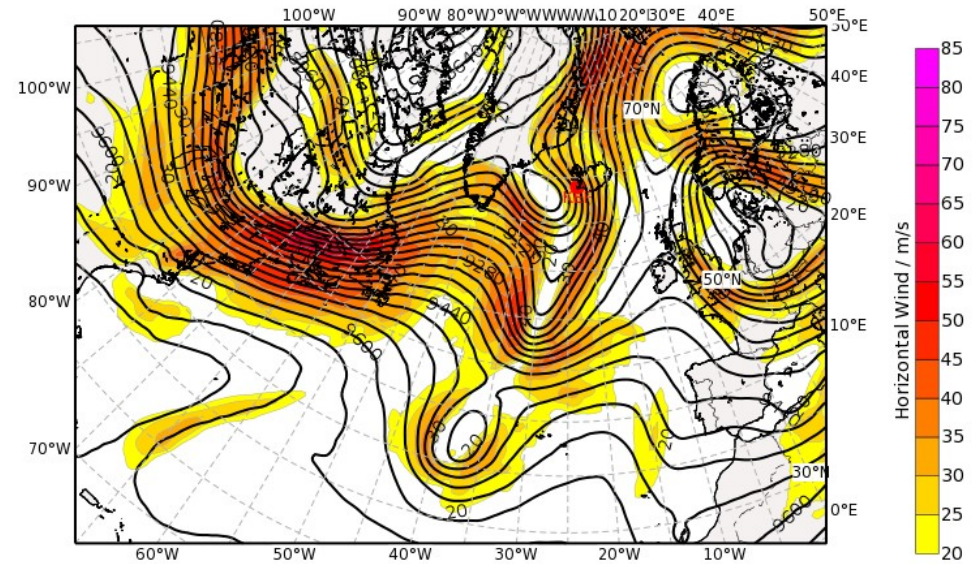


Outlook

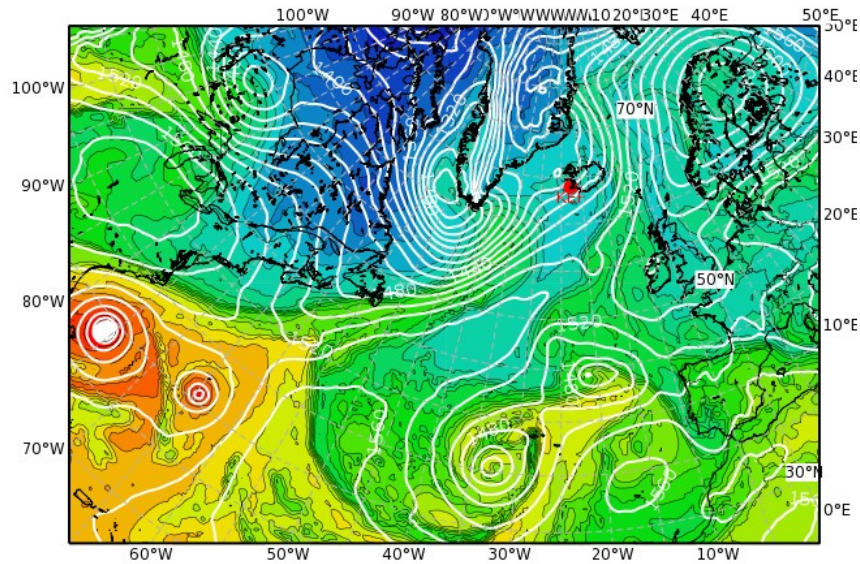
Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Sun, 09 Oct 2016, 12 UTC (step 084 h from Thu, 06 Oct 2016, 00 UTC)



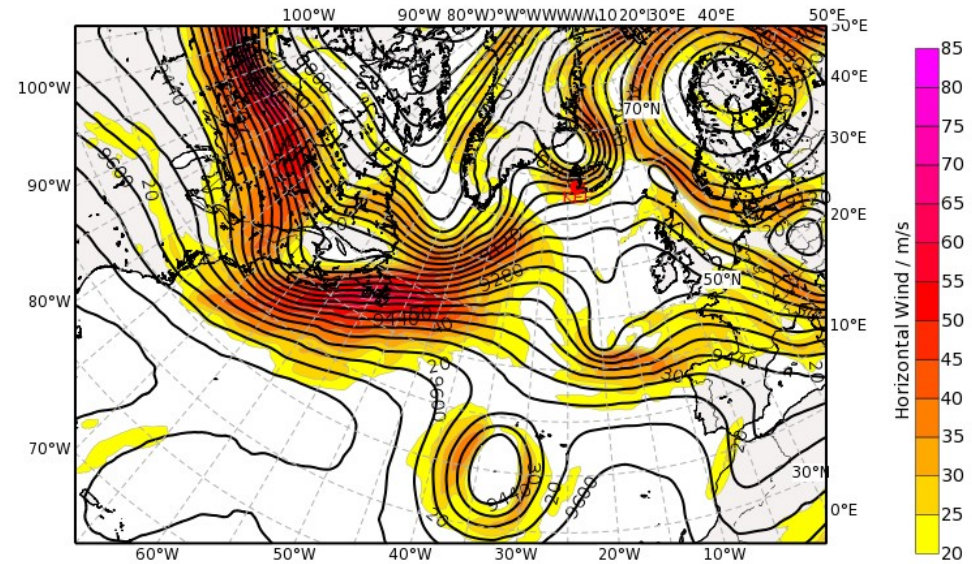
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Sun, 09 Oct 2016, 12 UTC (step 084 h from Thu, 06 Oct 2016, 00 UTC)



Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Mon, 10 Oct 2016, 12 UTC (step 108 h from Thu, 06 Oct 2016, 00 UTC)



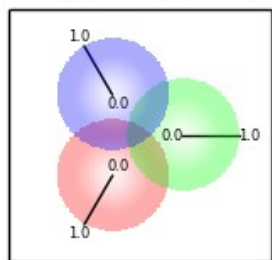
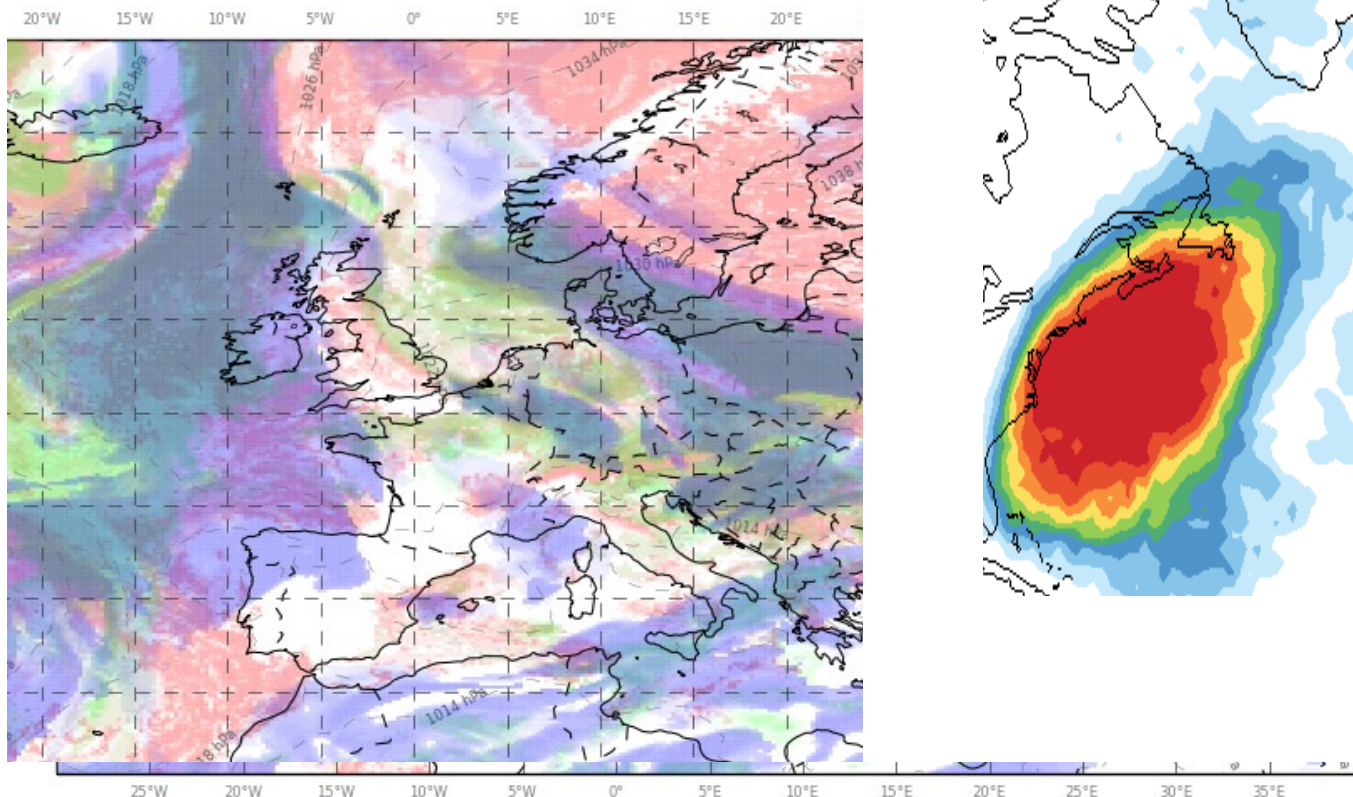
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Mon, 10 Oct 2016, 12 UTC (step 108 h from Thu, 06 Oct 2016, 00 UTC)



Forecast for Mon 10 Oct 2016 12 UTC

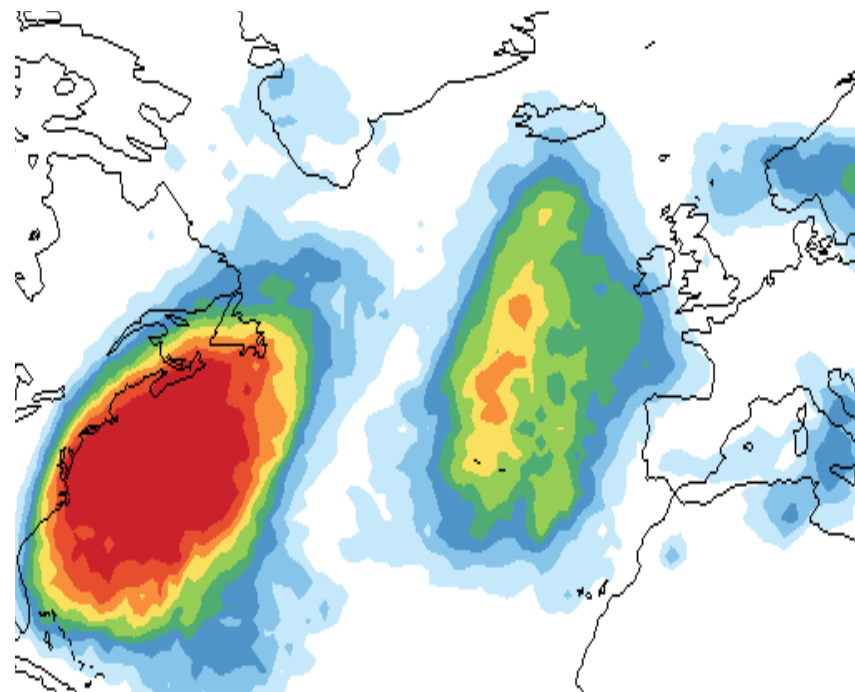
Clouds (UKMO 06/00z)

Met Office Oper. Global: Cloud: Low, Medium, High
2016/10/10 12Z T+108 from 2016/10/06 00Z

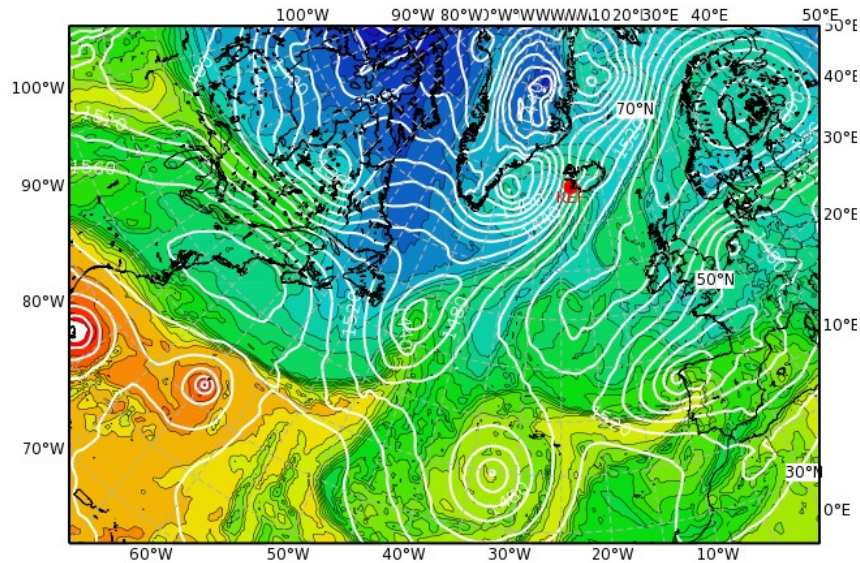


High cloud (~18000ft to ~45000ft) is blue,
mid-level cloud (~6000ft to ~18000ft) is green,
low cloud (surface to ~6000ft) is red
and the cloud types are combined as shown.

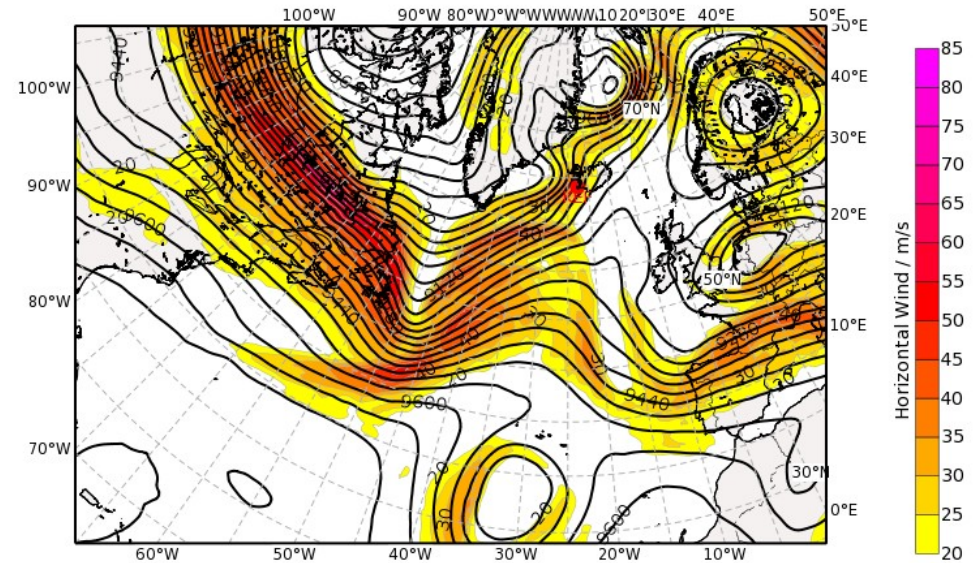
WCB Probs (EC 05/12z)



Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Tue, 11 Oct 2016, 12 UTC (step 132 h from Thu, 06 Oct 2016, 00 UTC)

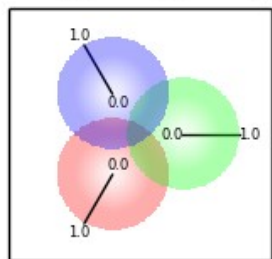
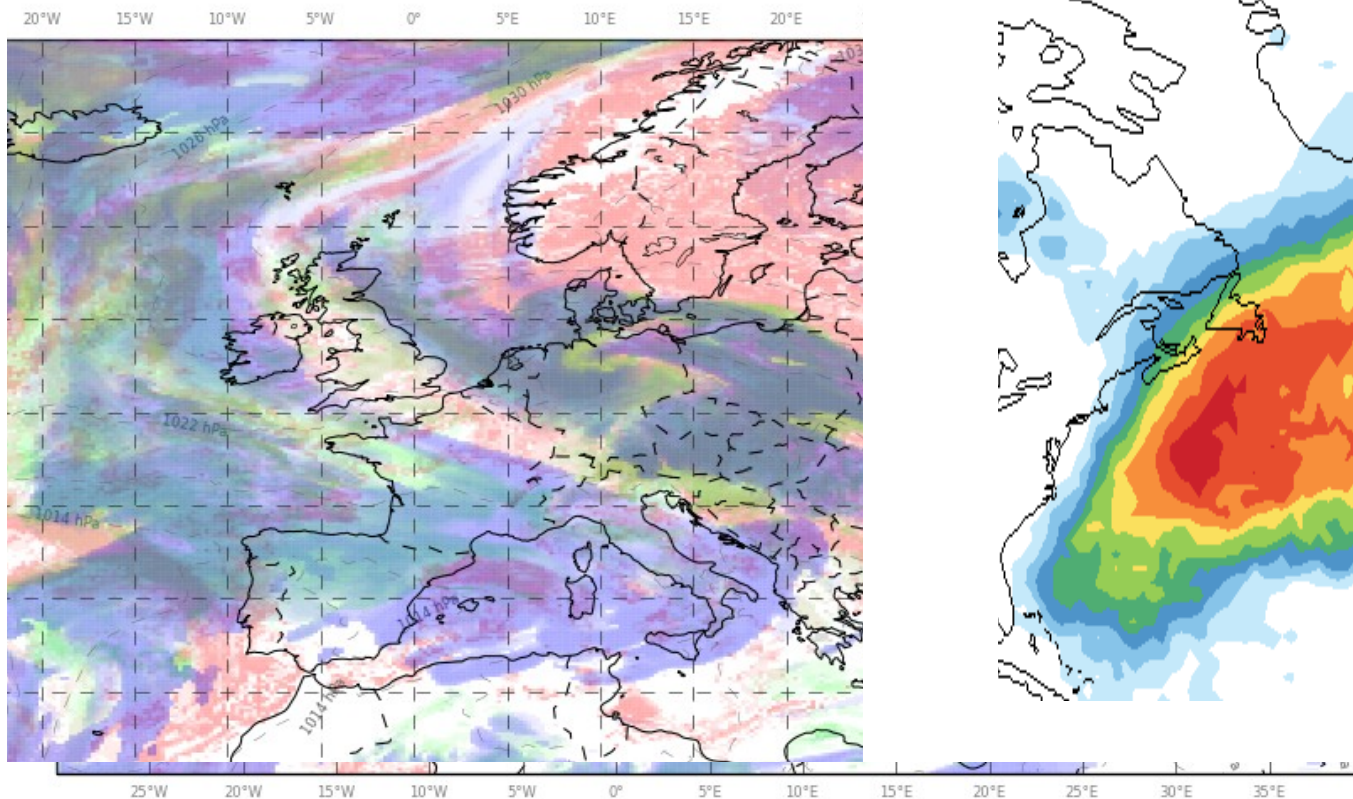


Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Tue, 11 Oct 2016, 12 UTC (step 132 h from Thu, 06 Oct 2016, 00 UTC)

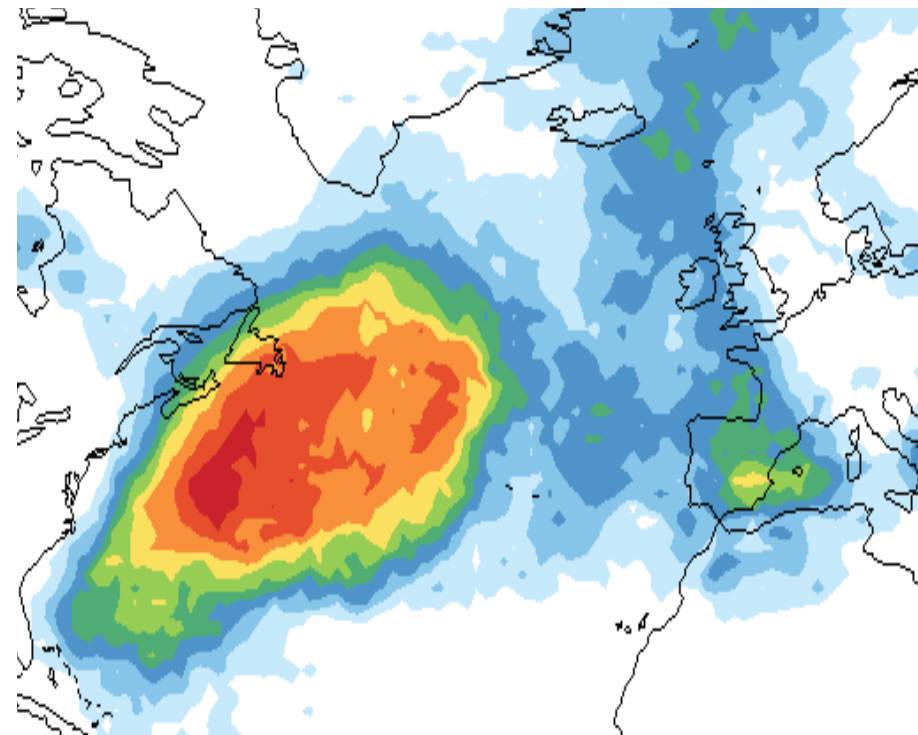


Forecast for Tue 11 Oct 2016 12 UTC

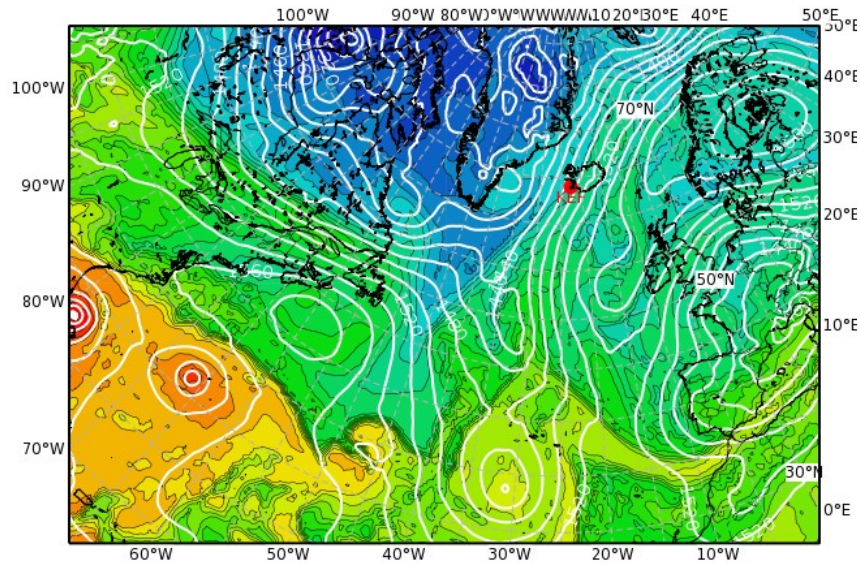
Met Office Oper. Global: Cloud: Low, Medium, High
2016/10/11 12Z T+132 from 2016/10/06 00Z



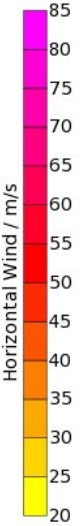
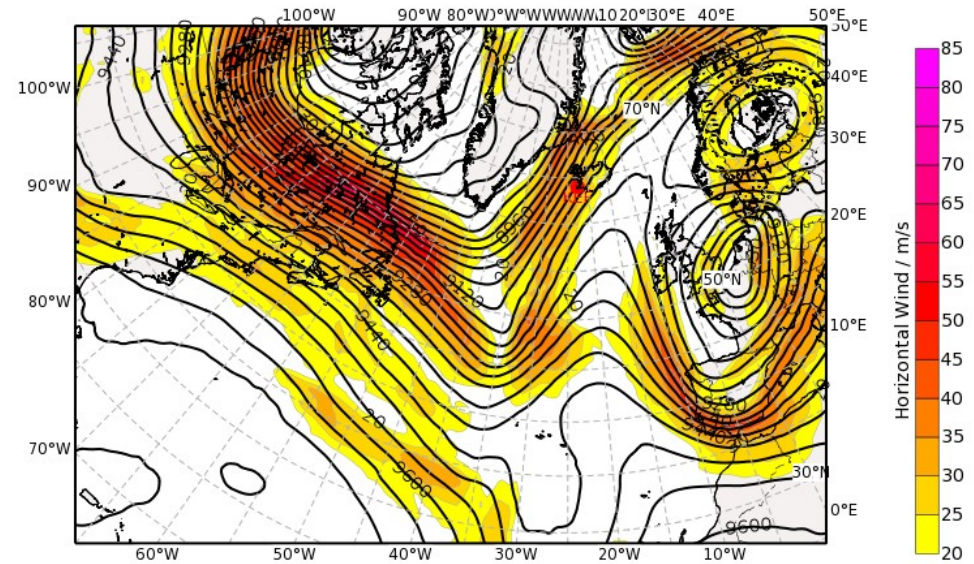
High cloud (~18000ft to ~45000ft) is blue,
mid-level cloud (~6000ft to ~18000ft) is green,
low cloud (surface to ~6000ft) is red
and the cloud types are combined as shown.



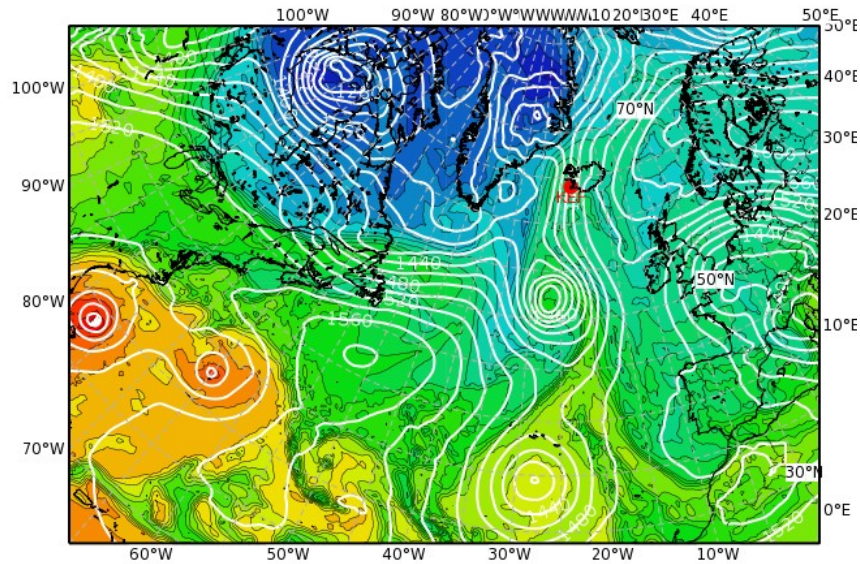
Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Wed, 12 Oct 2016, 12 UTC (step 156 h from Thu, 06 Oct 2016, 00 UTC)



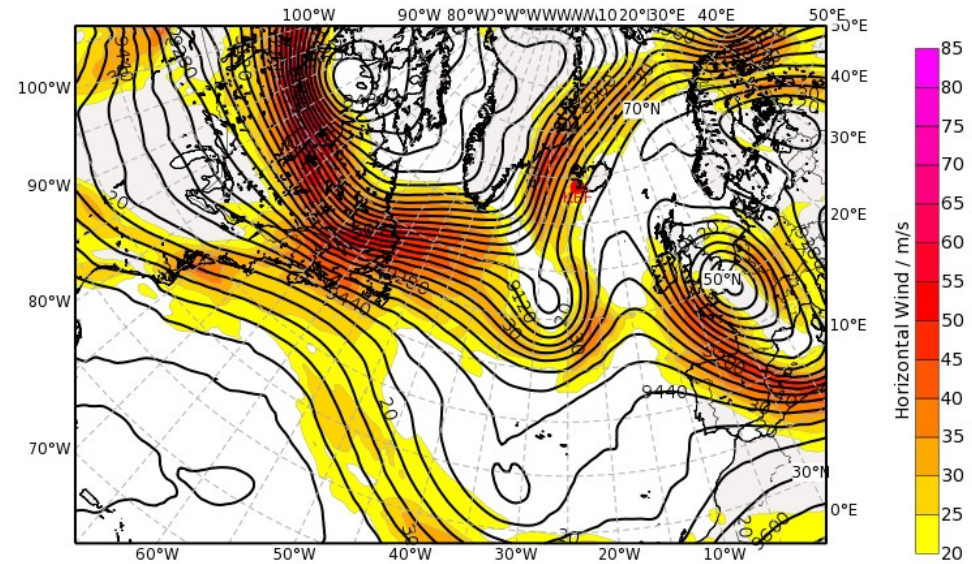
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Wed, 12 Oct 2016, 12 UTC (step 156 h from Thu, 06 Oct 2016, 00 UTC)



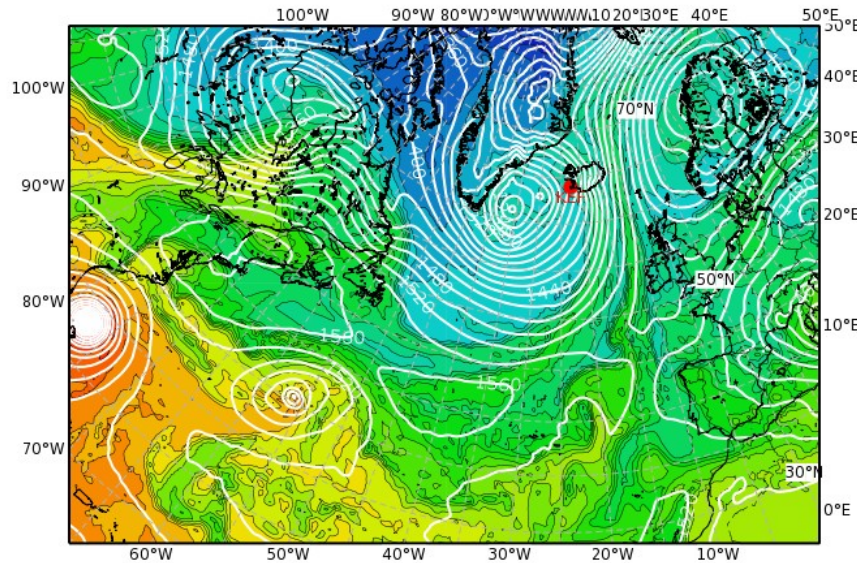
Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Thu, 13 Oct 2016, 12 UTC (step 180 h from Thu, 06 Oct 2016, 00 UTC)



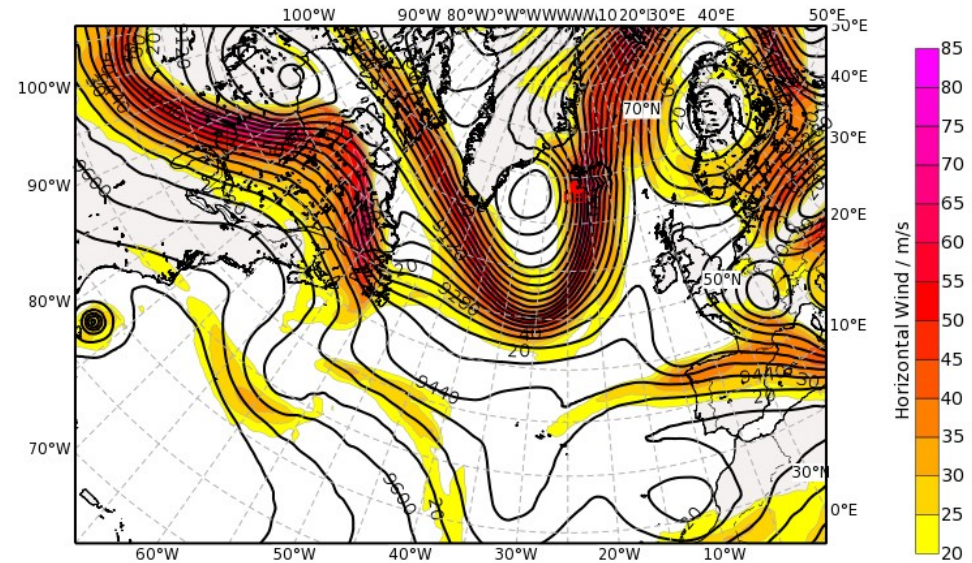
Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Thu, 13 Oct 2016, 12 UTC (step 180 h from Thu, 06 Oct 2016, 00 UTC)



Equivalent Potential Temperature (degC) & Streamlines at 850 hPa
Valid: Fri, 07 Oct 2016, 12 UTC (step 132 h from Sun, 02 Oct 2016, 00 UTC)



Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Fri, 07 Oct 2016, 12 UTC (step 132 h from Sun, 02 Oct 2016, 00 UTC)



Radiosoundings

Friday 7 October

HALO flight

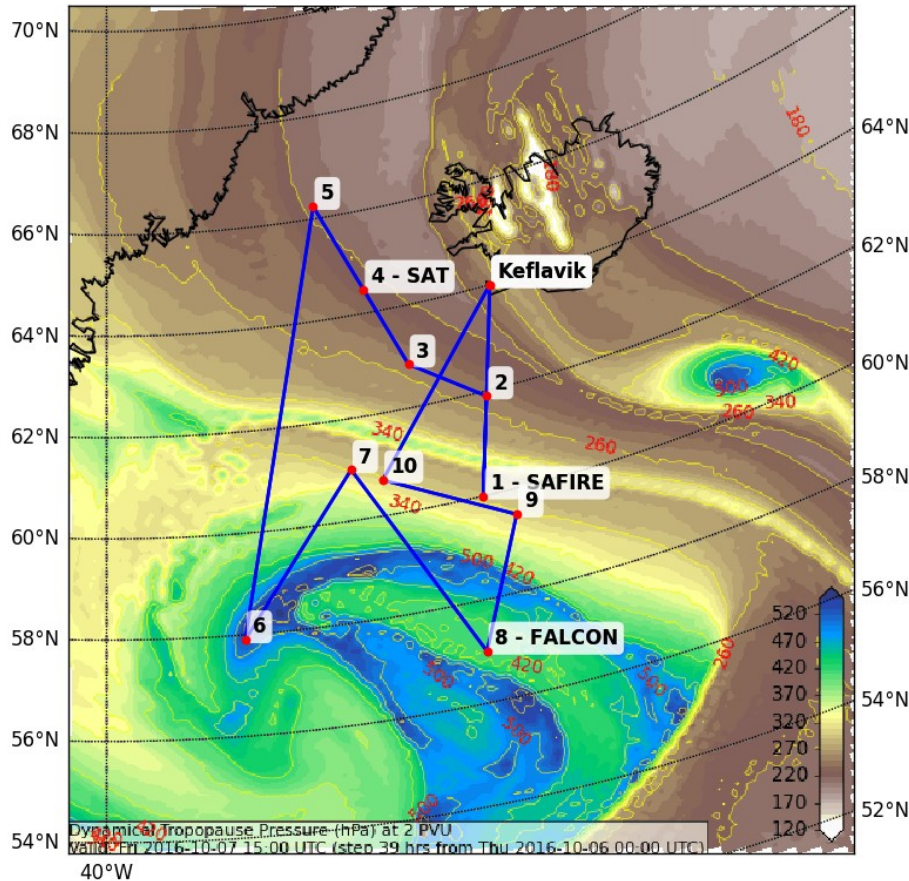
Friday 7 October HALO Flight 13:00 – 18:30 UTC

Scientific Objectives

- WCB ascent region: sample mixed phase clouds
- Lagrangian flight through EX-TPV
- SAT overpass
- Coordinated leg with SAFIRE: atmospheric river
- Coordinated leg with FALCON: PV estimation

Friday 7 October HALO Flight 13:00 – 18:30 UTC

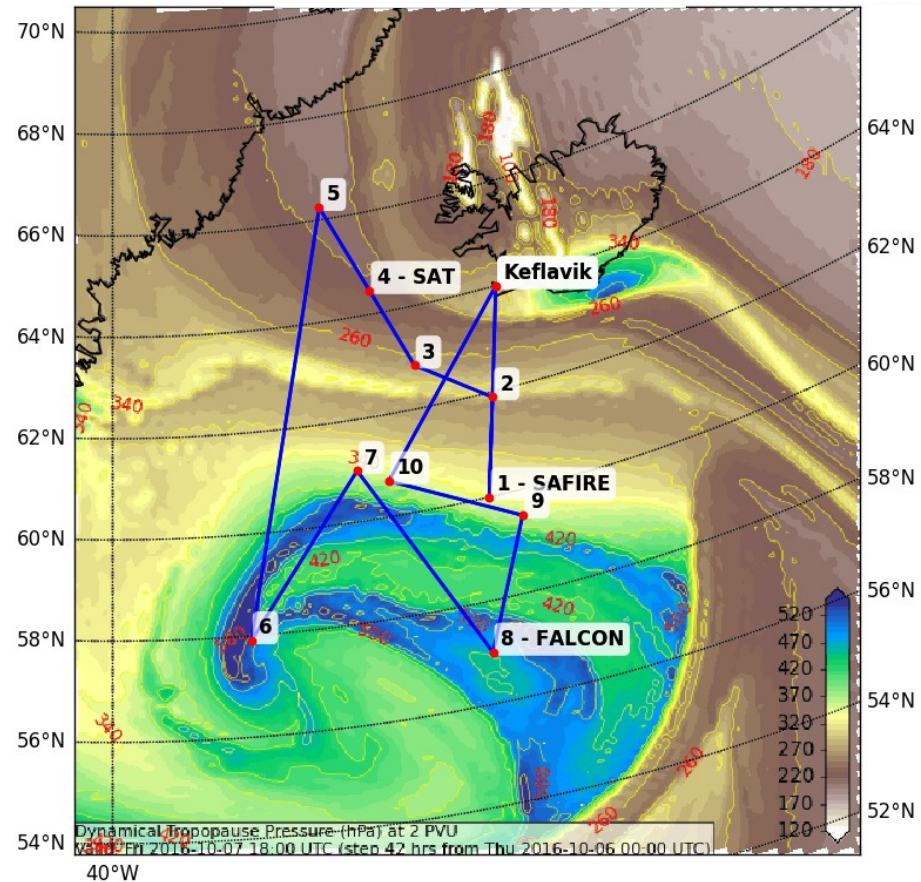
P (hPa) at 2 PVU



BT06/00Z VT07/15Z

- Meet SAFIRE at 13:40 (1)
- Coordinated leg (1-2)
- Sat overpass at 14:27 & WCB ascent (4-6)

P (hPa) at 2 PVU



BT06/00Z VT07/18Z

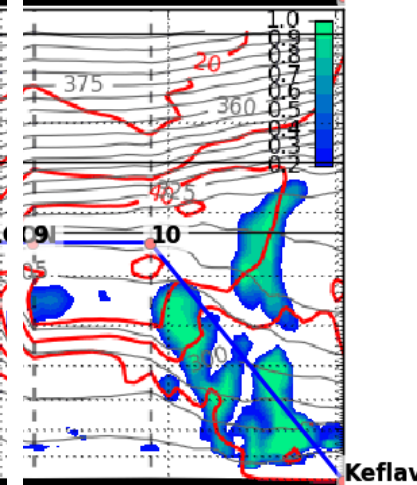
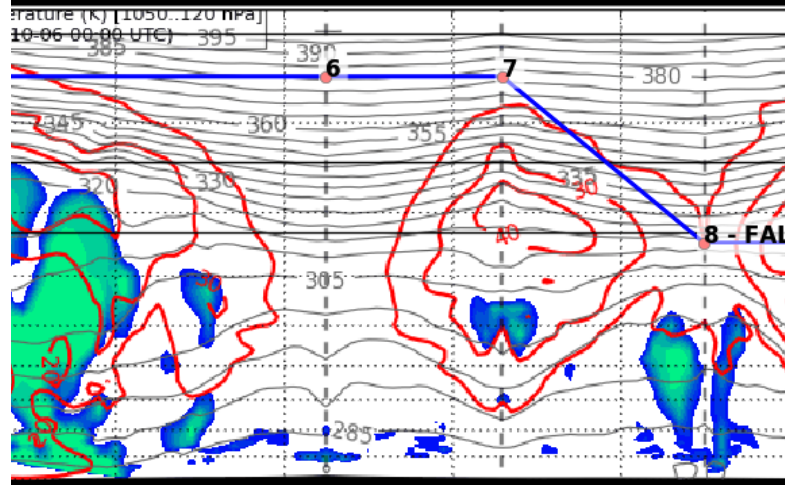
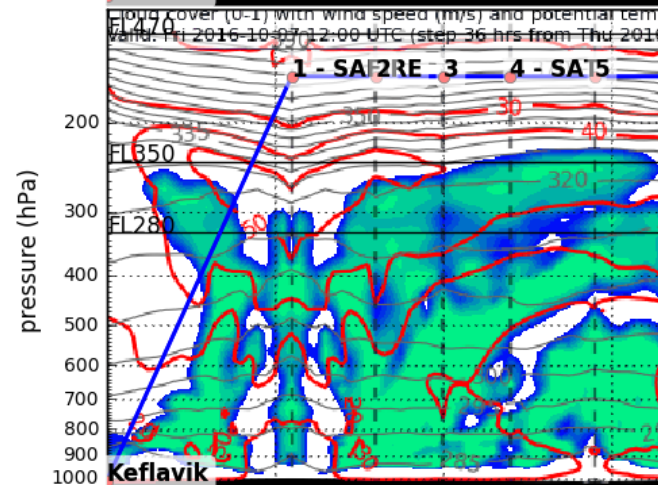
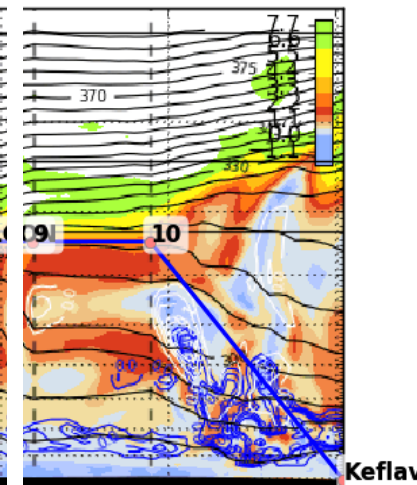
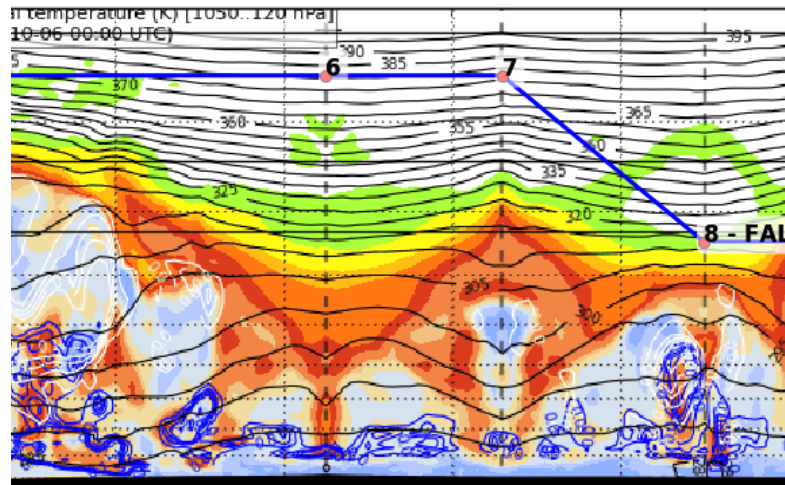
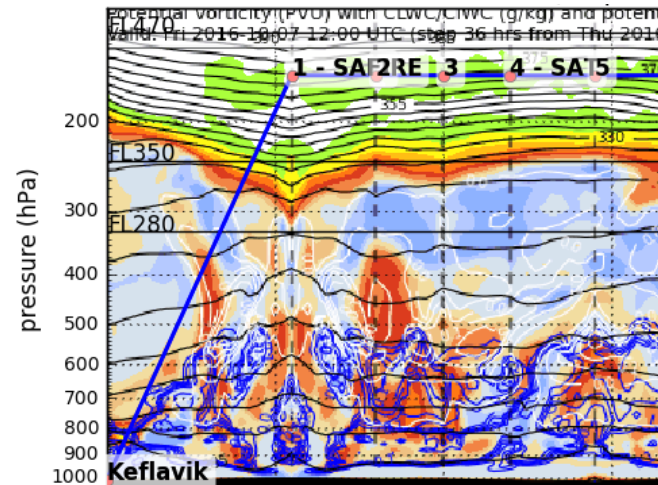
- EX-TPV (6)
- Meet FALCON at 17:15 (8)
- Coordinated leg with drops (8-10)

Friday 7 October HALO Flight 13:00 – 18:30 UTC

BT06/00Z VT07/12Z

BT06/00Z VT07/15Z

BT06/00Z VT07/18Z



64.0, -22.6
 60.4, -24.8
 62.8, -26.9
 65.9, -30.1

62.4, -32.5
 58.8, -34.4
 60.1, -31.5
 58.7, -27.6
 55.8, -24.8

61.0, -28.3
 63.9, -22.9

SAFIRE

SAT

WCB

EX-TPV

FALCON

Friday 7 October

DLR-Falcon flight

DLR-FALCON Friday Flight

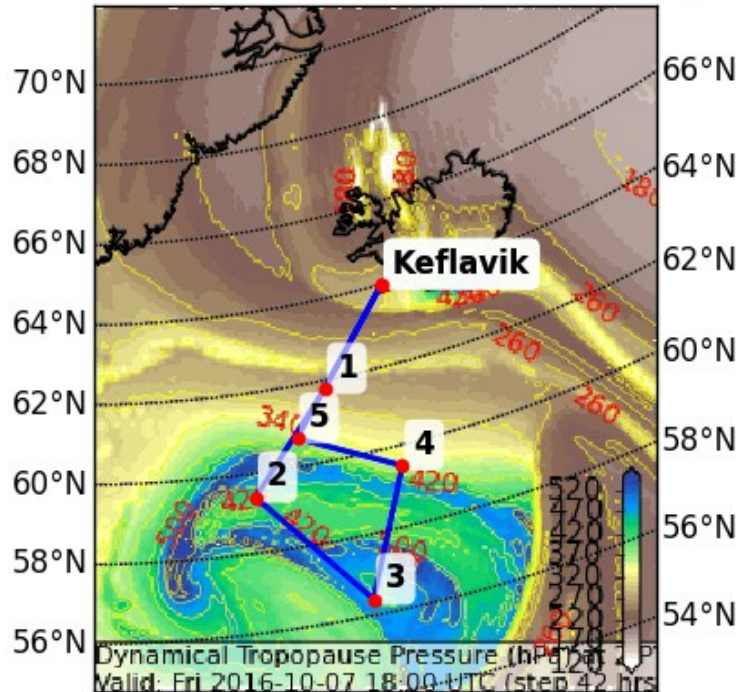
- Coordinated legs with HALO
- PV-meter in combination with HALO & dropsondes
- Circuit to estimate divergence
- Timing: Centered around meeting point with HALO, 1715Z, waypoint 3.
- Take off ~ 1535Z, flighttime ~3h 15min

Change since yesterday: Slight adjustment of waypoints 1,4 and 5

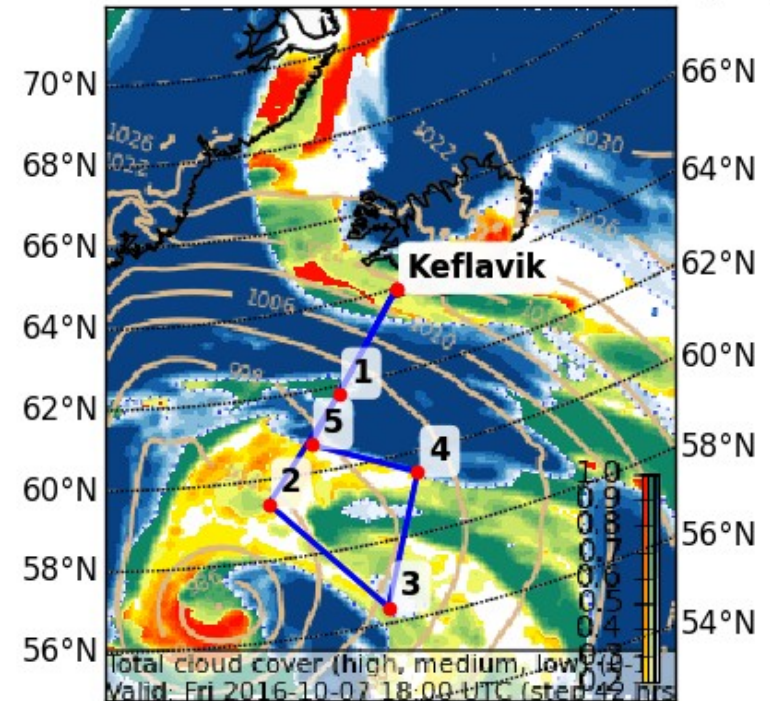
Falcon flight Friday, 07 Oct

BT 06/00Z, VT 07/18Z

Dynamical Tropopause (Pressure (hPa)
Valid: Fr 2016-10-07 18:00 UTC (step



Cloud Cover (0-1) (Total Cloud Cover,
Valid: Fr 2016-10-07 18:00 UTC (step

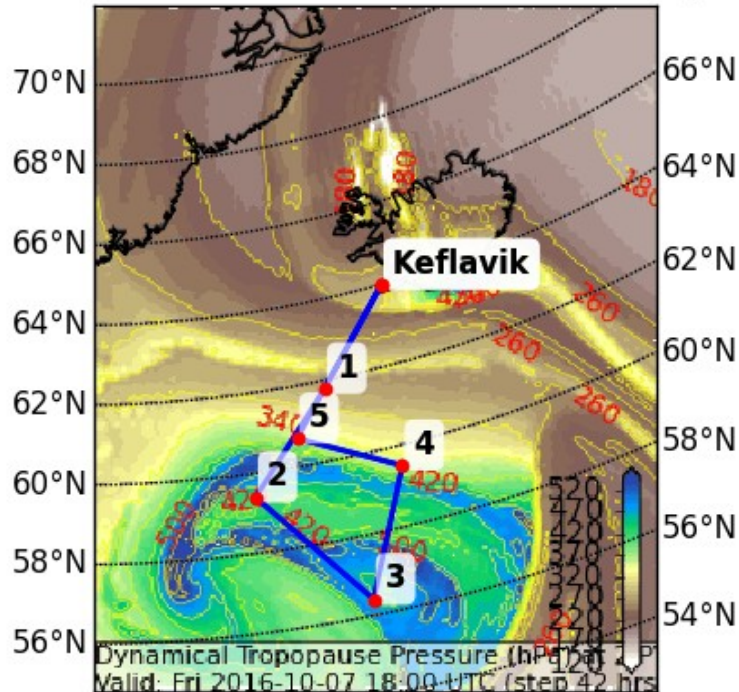


- Legs 3-5 coordinated with HALO
 - PV-meter legs
- Leg 4-5 must be ok for LIDAR, has been adjusted (southward) due to clouds
- Flight level constraints due to NAT TRACKS -> TBD how high we can go.
 - The higher the better, we asked for FL290

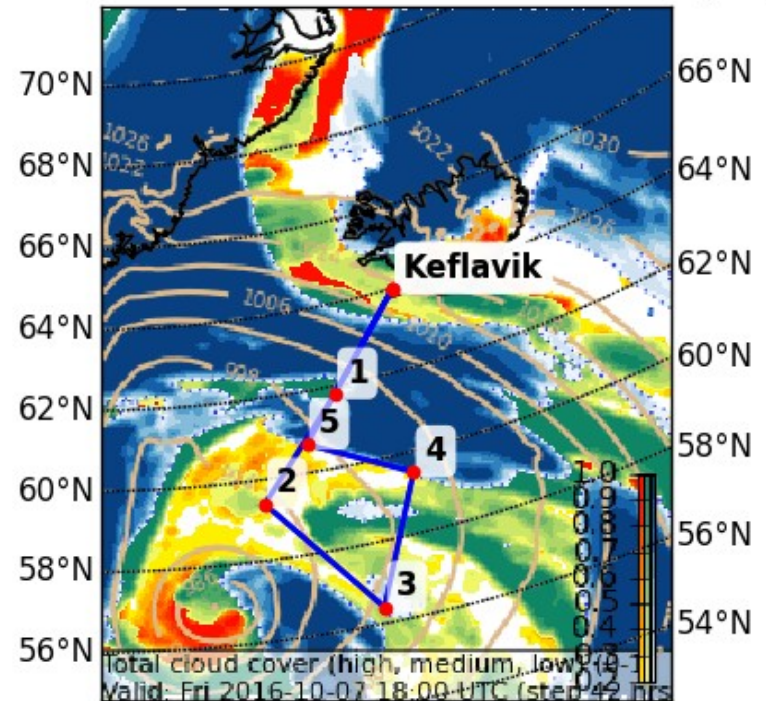
Falcon flight Friday, 07 Oct

BT 06/00Z, VT 07/18Z

Dynamical Tropopause (Pressure (hPa)
Valid: Fr 2016-10-07 18:00 UTC (step



Cloud Cover (0-1) (Total Cloud Cover,
Valid: Fr 2016-10-07 18:00 UTC (step

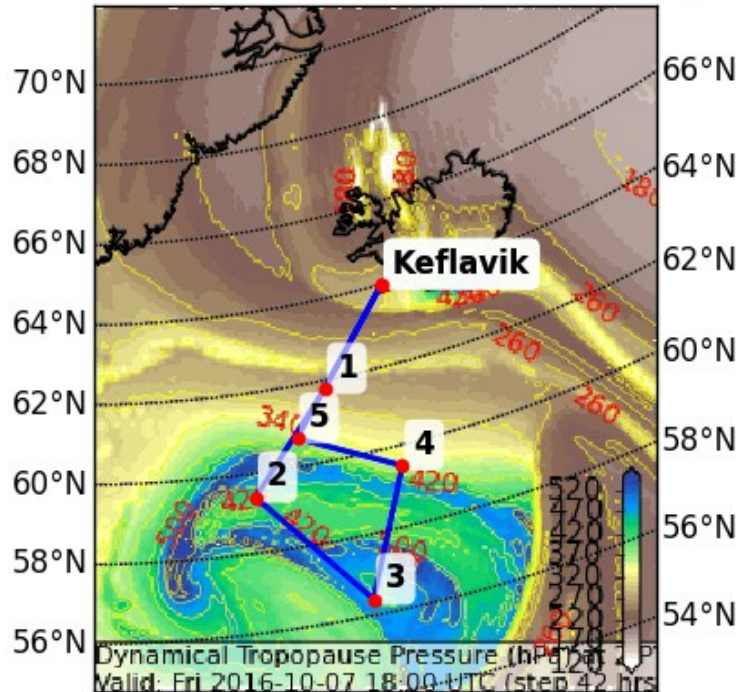


- Legs 3-5 coordinated with HALO
 - PV-meter legs
- Leg 4-5 must be ok for LIDAR, has been adjusted (southward) due to clouds
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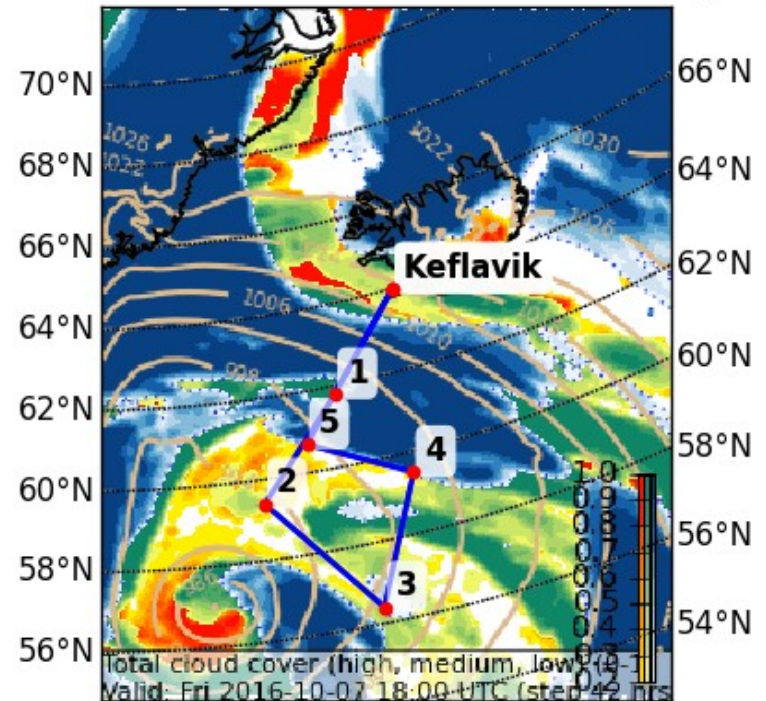
Falcon flight Friday, 07 Oct

BT 06/00Z, VT 07/18Z

Dynamical Tropopause (Pressure (hPa)
Valid: Fr 2016-10-07 18:00 UTC (step



Cloud Cover (0-1) (Total Cloud Cover,
Valid: Fr 2016-10-07 18:00 UTC (step

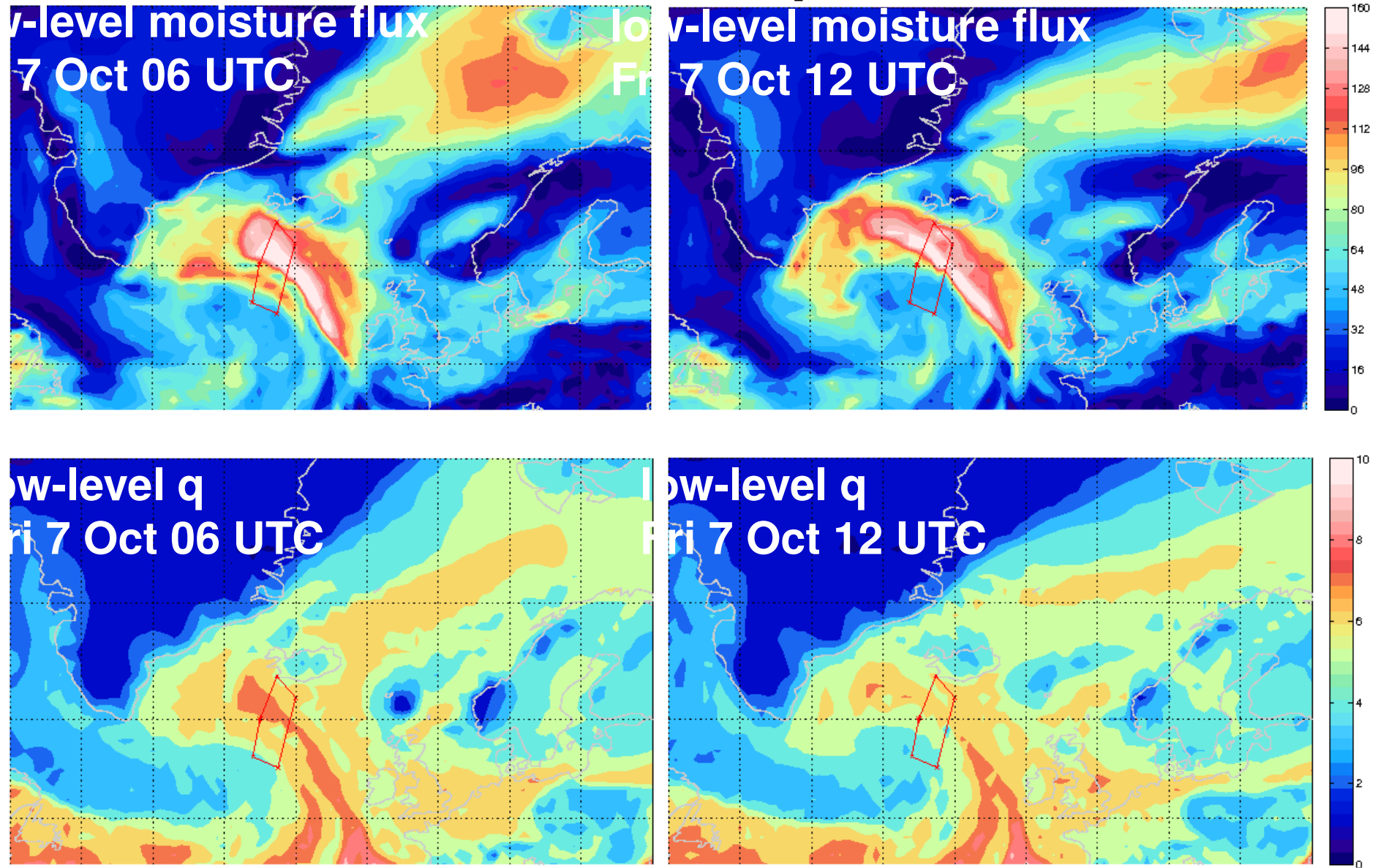


- Legs 3-5 coordinated with HALO
 - PV-meter legs
- Leg 4-5 must be ok for LIDAR, has been adjusted (southward) due to clouds
- Flight level constraints due to NAT TRACKS -> TBD how high we can go.
 - The higher the better, we asked for FL290

Friday 7 October

Safire flight

EPATAN/NEAREX science plans for 7 Oct 2016



ECMWF det, base time 20161005_12

ATAN/NEAREX science plans for 7 Oct 2016

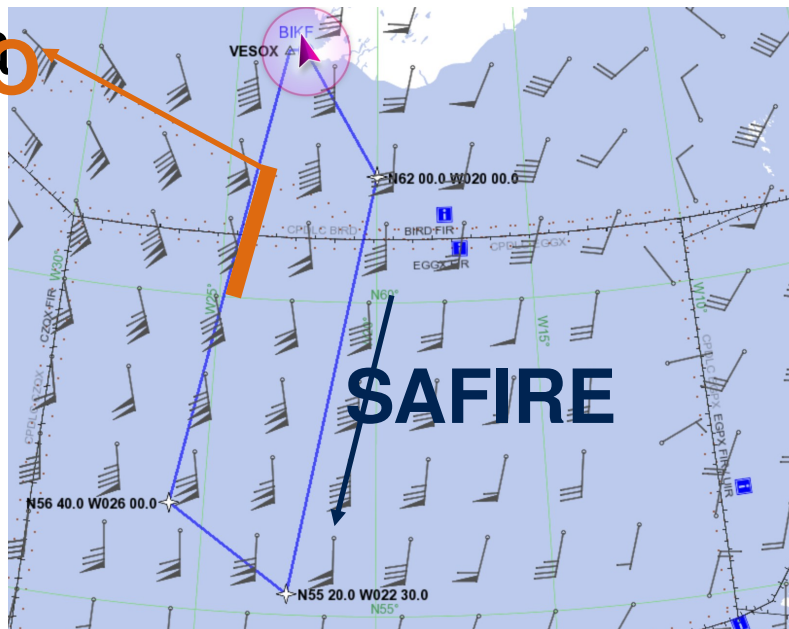
off ca. 1130 UTC, return ca. 14:20 UTC

isture handover" between sequential cyclones
directed towards NW with heavy precipitation in Greenl

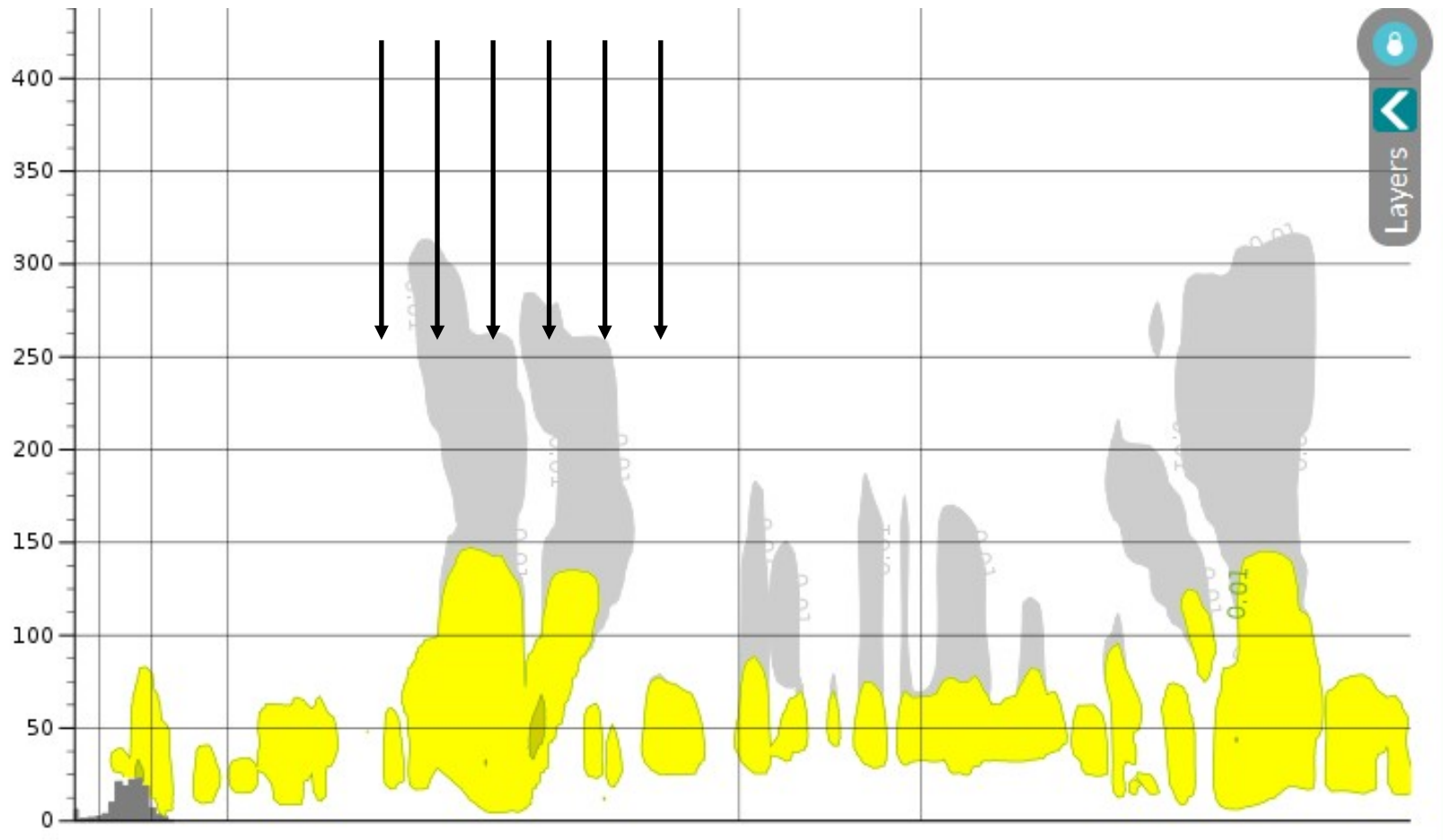
rdinated leg with HALO, rendezvous 13:40 UTC

6 drop sondes on comparison leg

rdina
HALO con and HALO at 56.4N 26



EPATAN/NEAREX science plans for 7 Oct 2016



ARPEGE det, base time 20161006_00

HALO flight Sun/Mon 09/10 Oct

System under investigation:

„Sunday PV streamer“

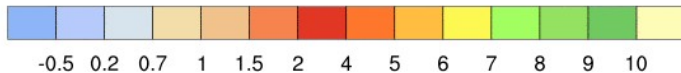
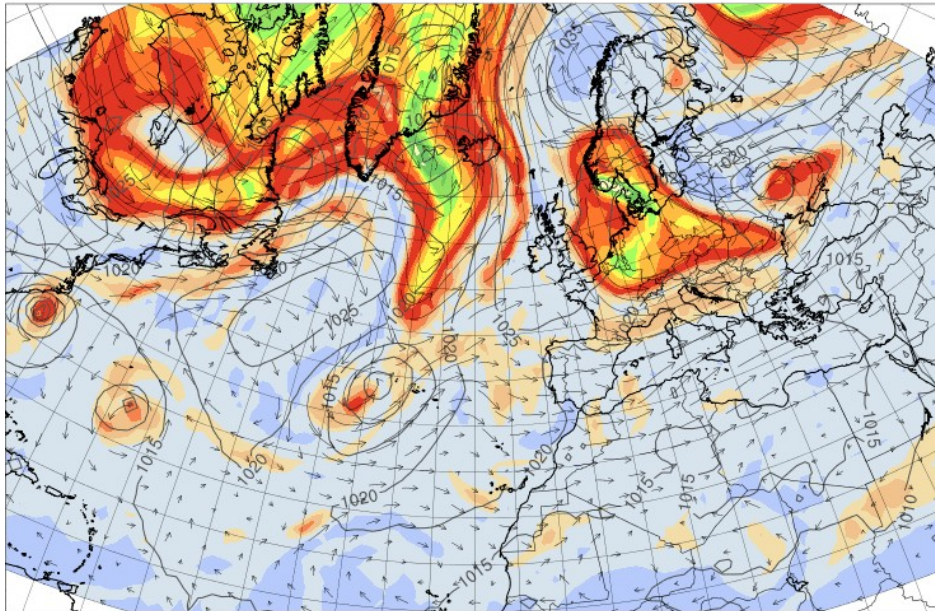
Main objectives:

- WCB ascent
- WCB interaction with PV streamer
- Structure of PV streamer
- Monday: intercomparison flight Safire, FAAM, Halo and Satellite

HALO flight Sun 09 Oct

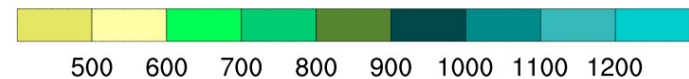
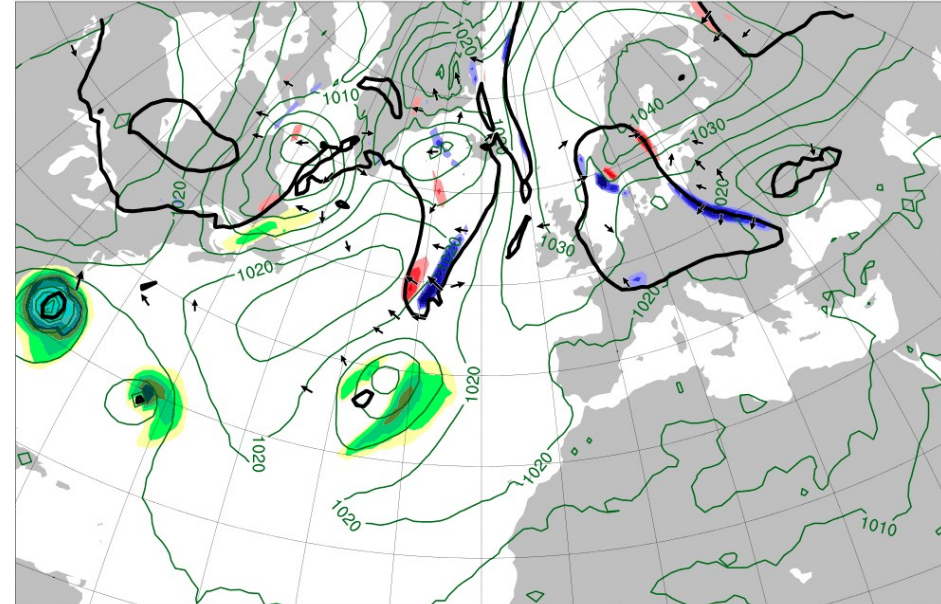
12 UTC

PV@320K at 20161009_12



pvu

2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161006_00, VT: 20161009_12



kg/(m s)



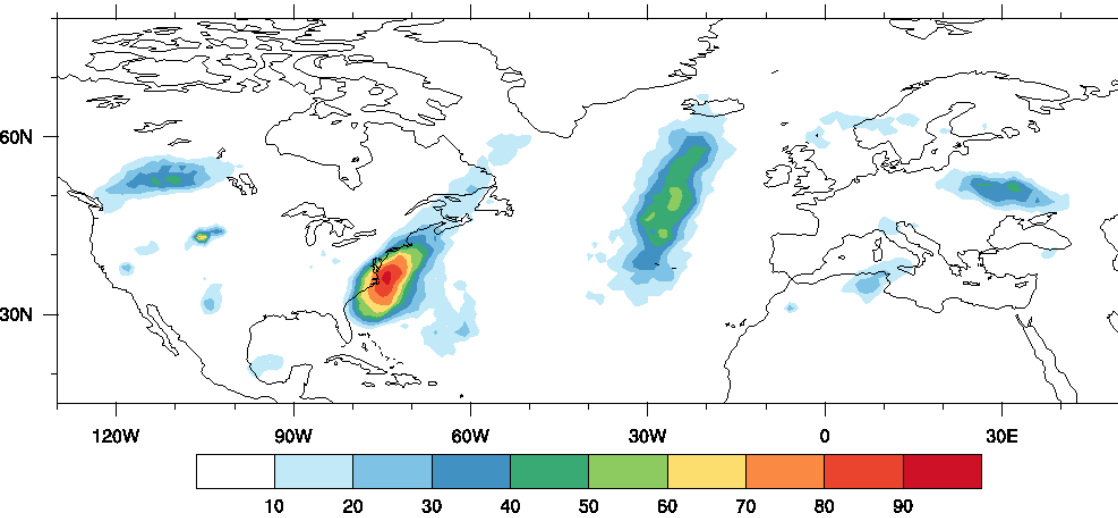
PVU/d

HALO flight Sun 09 Oct

in800-400hPa: Probability [%] of traj. occurrence in ENS

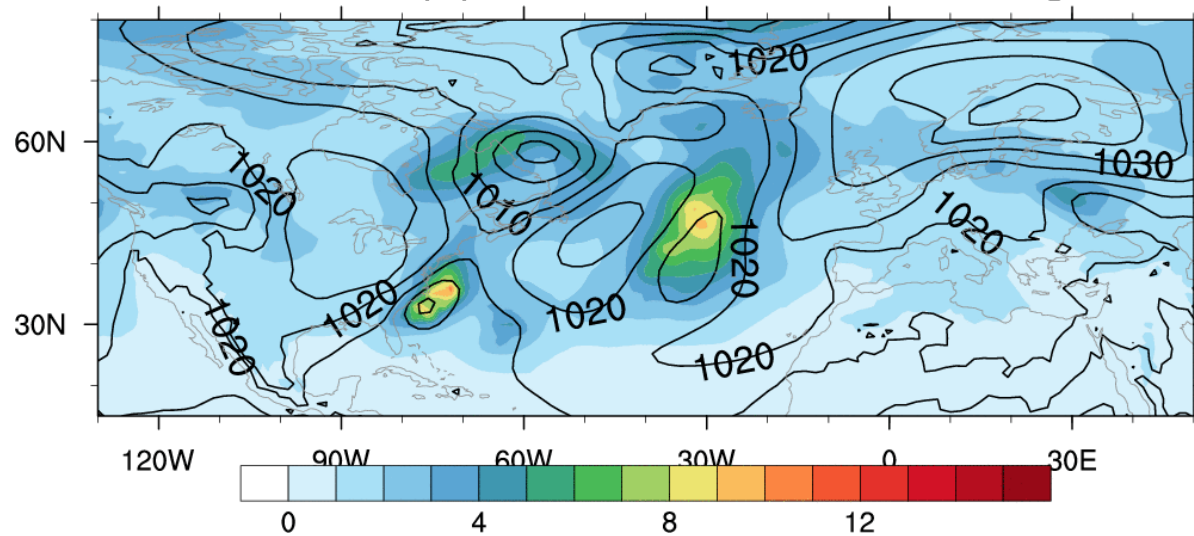
ECMWF ensemble forecast
BT 20161005_12UTC
VT 20161009_12UTC

12 UTC



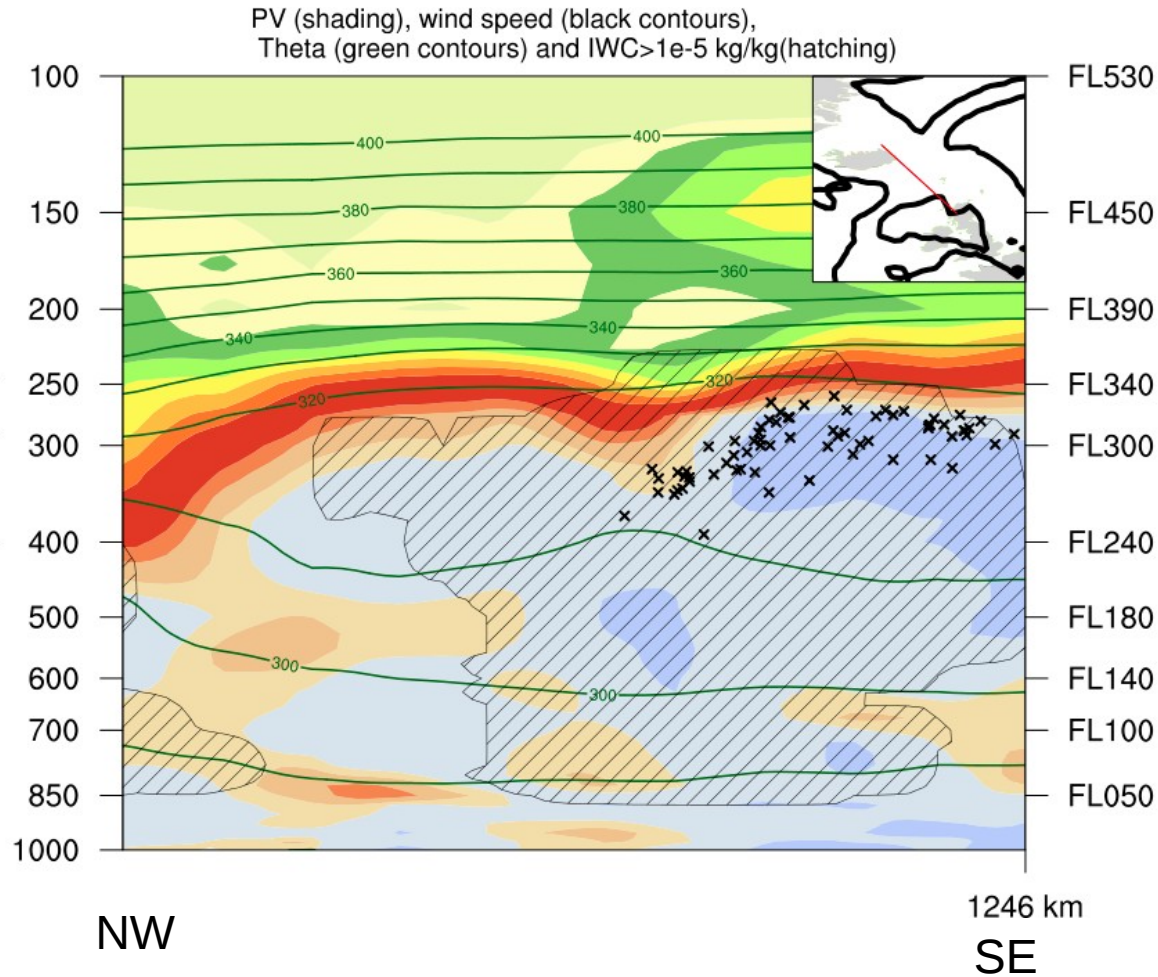
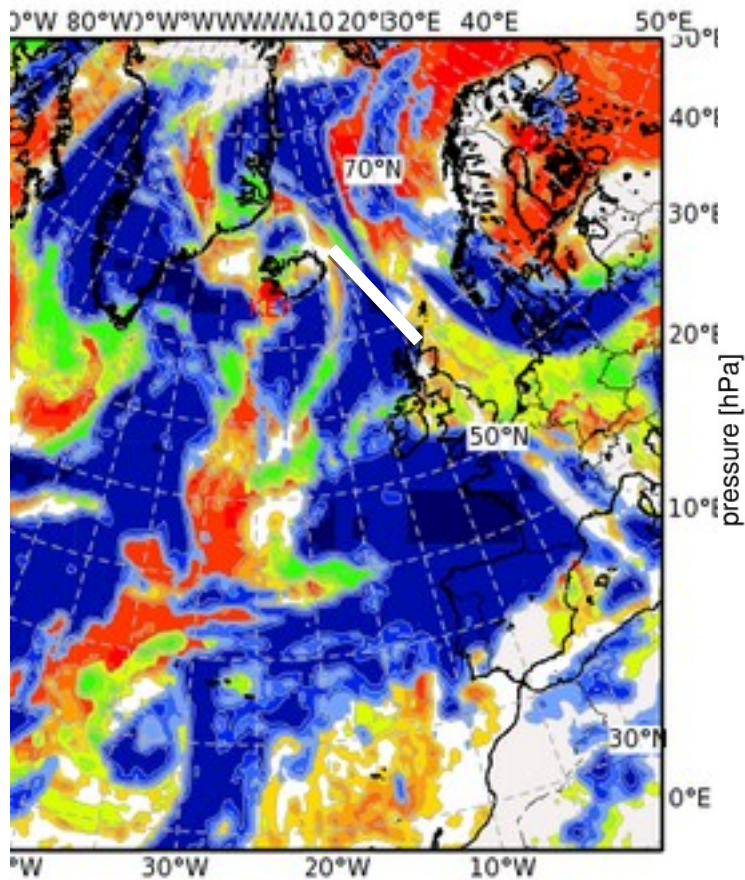
Pressure at mean sea level
ensemble mean and standard deviation [hPa]

ECMWF 51 member ensemble
BT 20161005_12UTC
VT 20161009_12UTC



HALO flight Mon 10 Oct

Sat overpass at 13:17 + Safire+FAAM+Halo



Summary plans

- **Thursday 6 October**
 - **HALO** TPV structure
- **Friday 7 October**
 - Strong winds in Keflavik
- **Outlook**
 - **Sat 8**
 - **Sun 9**
 - **Mon 10/Tue 11**

Radiometer Intercomparison

- **Scientific aims: Make co-incident passive and active measurements of ice cloud**
- **Constraints: satellite overpass at 13:17 UTC from Lewis → eastern Iceland**
- **Meteorological constraints:**
 - **Singificant depth of ice cloud. Ideally tops below FL320.**
 - **FAAM FL350 (Stuart Fox)**
 - **Safire FL370 (Julien Delanoe)**
 - **HALO FL390 (Mario Mech ?)**