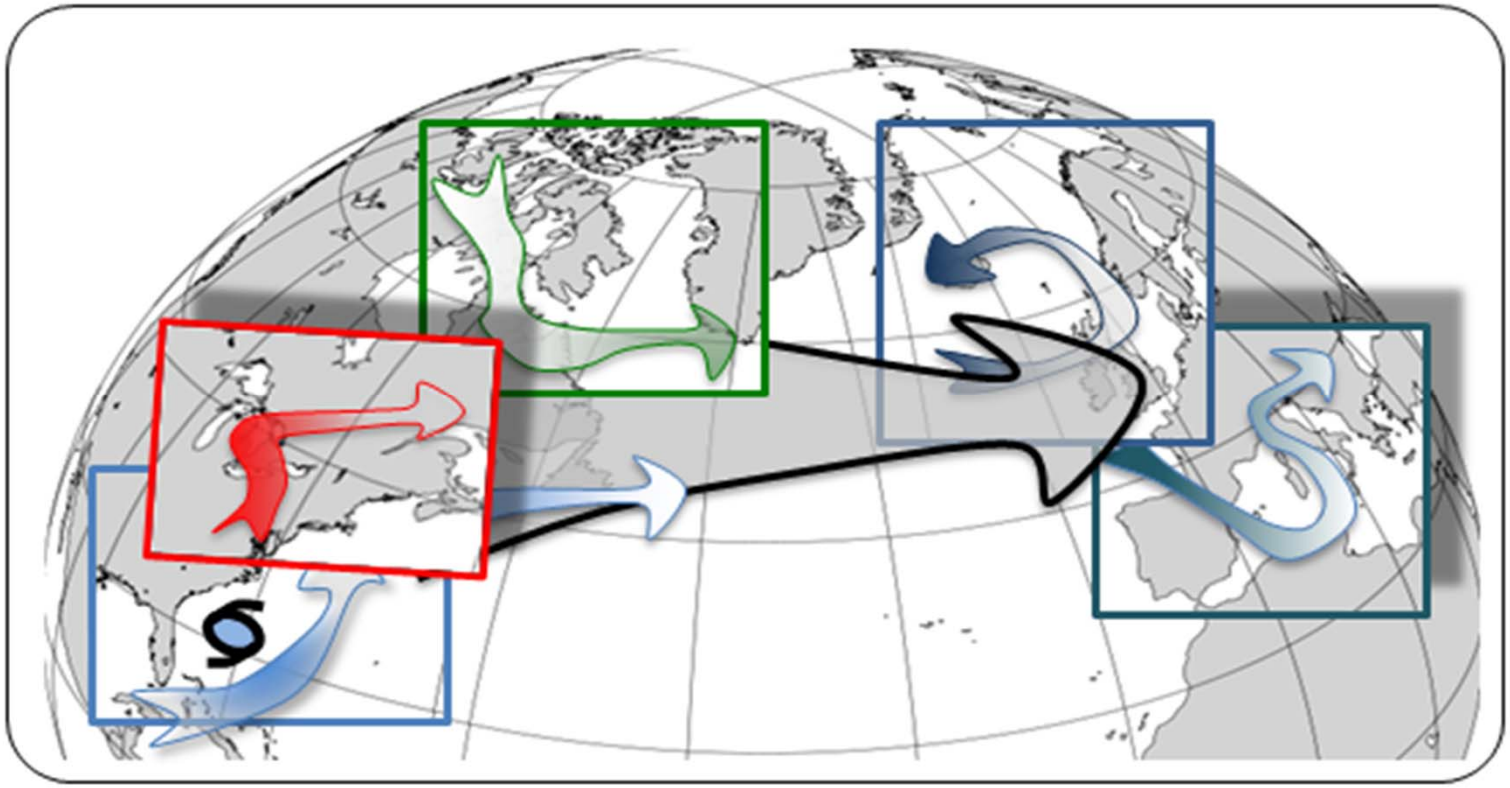
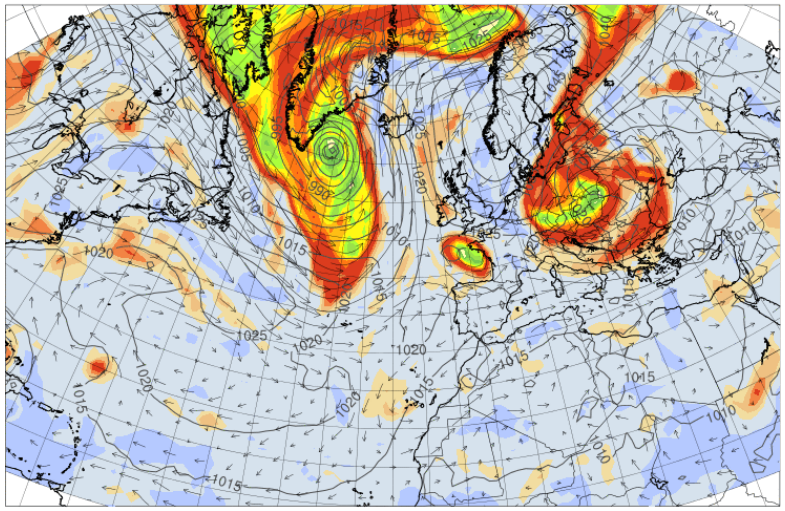
NAWDEX – Weather Discussion

05 October 2016, Keflavik 17 UTC

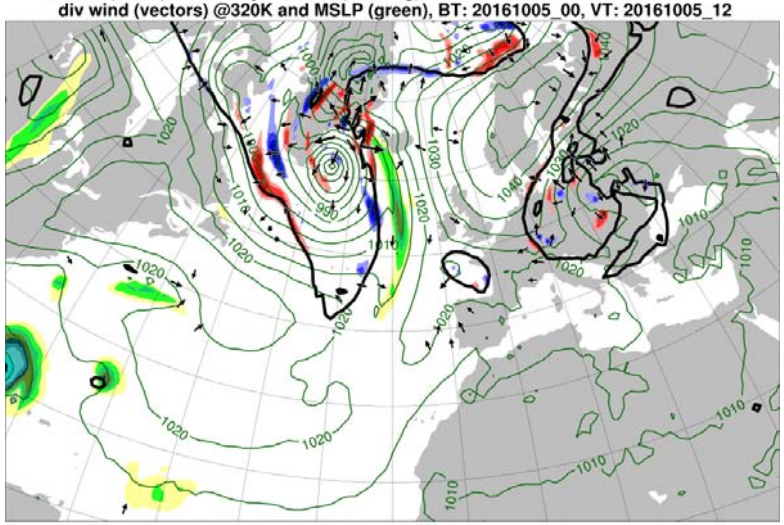


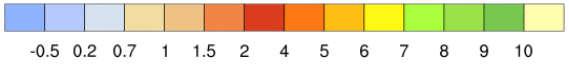
Forecast – Wed 5 Oct 2016, 12UTC PV320K, irrwind320K, THE850K, trajectories

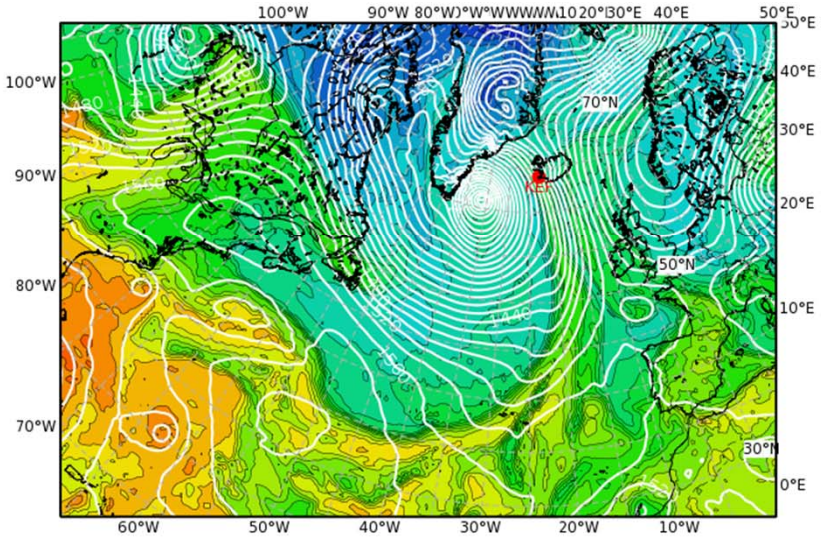
PV@320K at 20161005_12



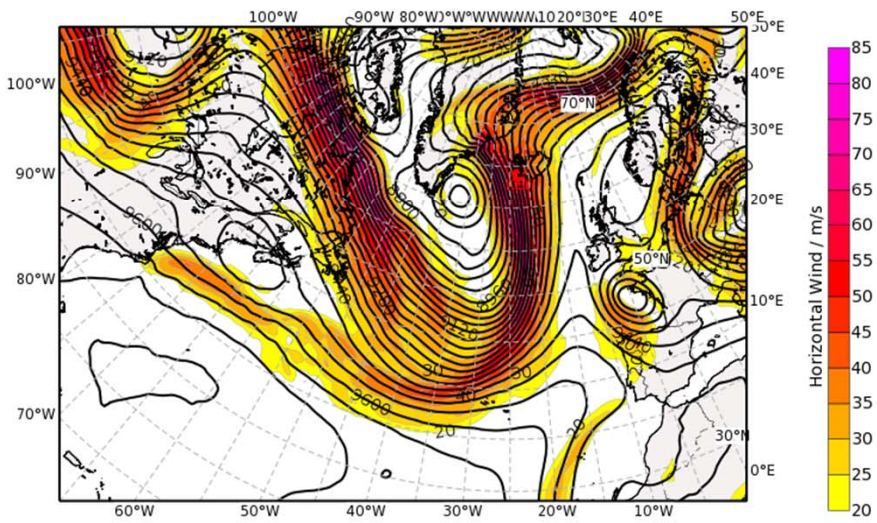
2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161005_12



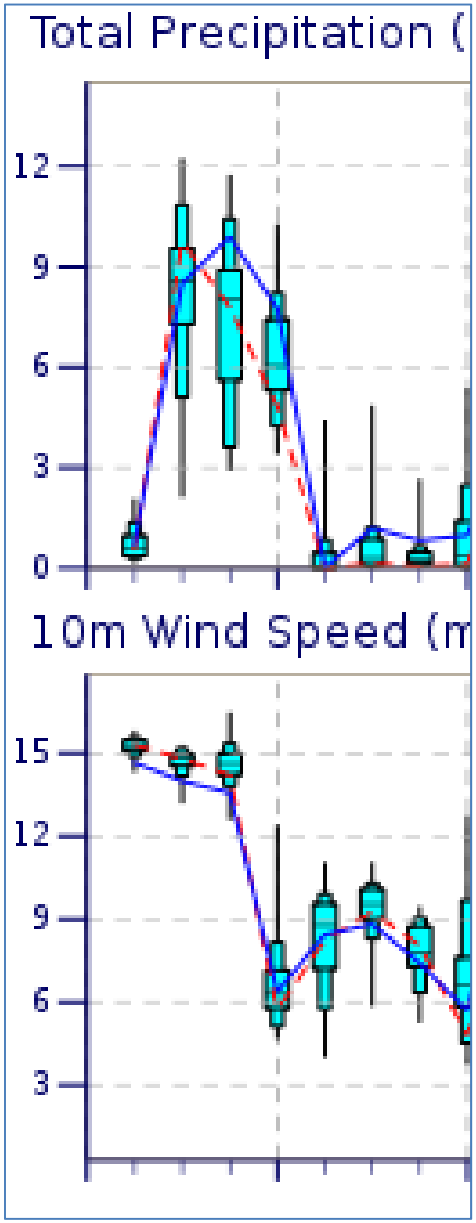




Geopotential Height (m) & Horizontal Wind (m/s) at 300 hPa
Valid: Wed, 05 Oct 2016, 12 UTC (step 012 h from Wed, 05 Oct 2016, 00 UTC)



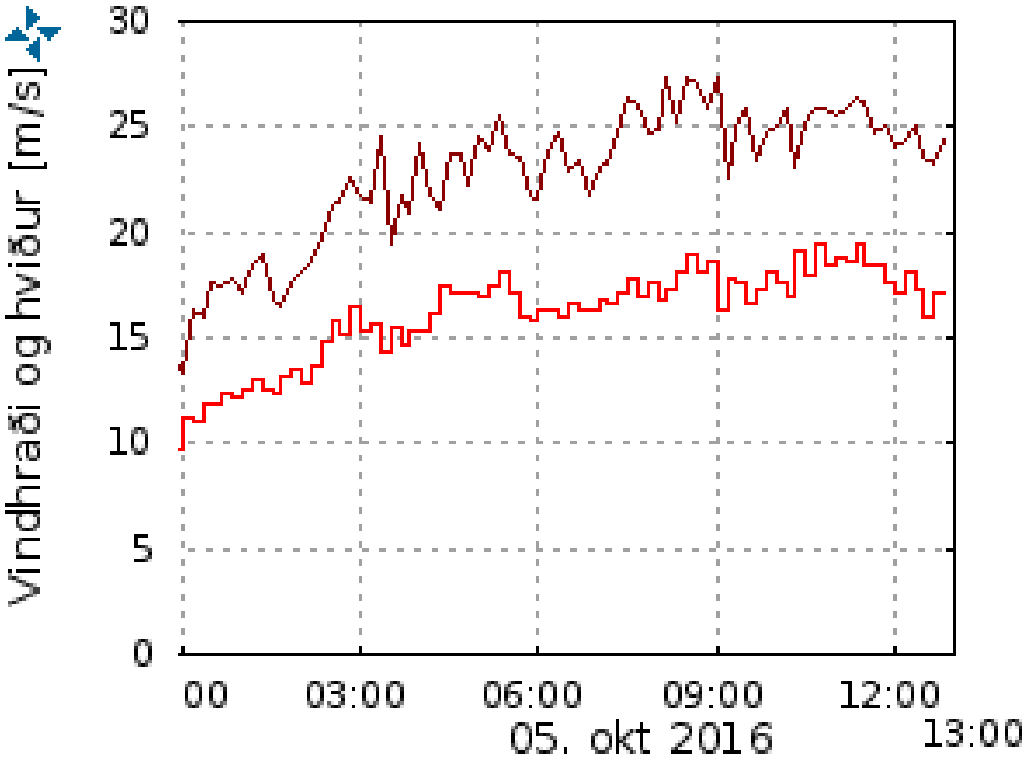
Strong winds on Wed 5 Oct 2016



ECMWF

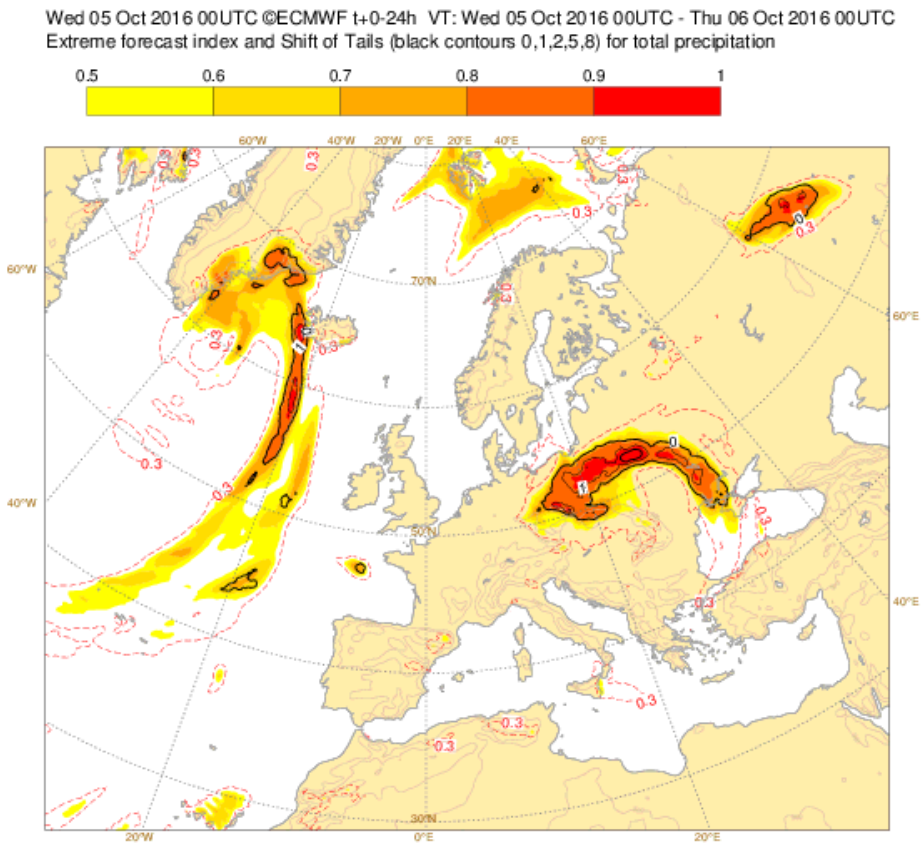
06Z: 15m/s
12Z: 14-15m/s
18Z: 14m/s

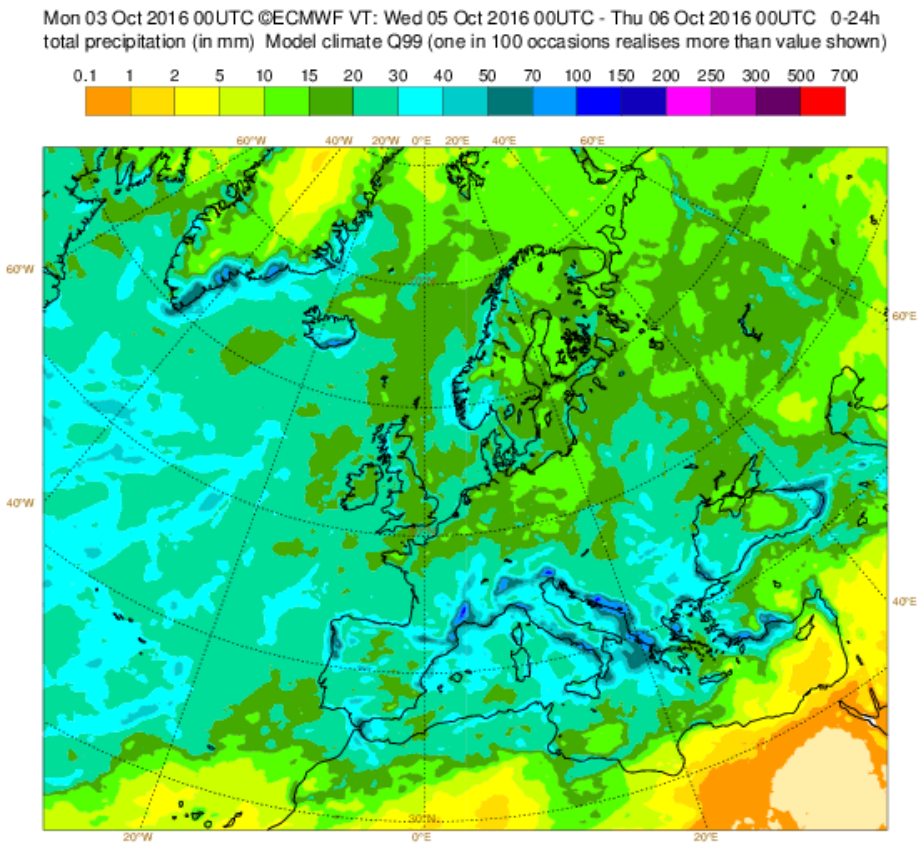
OBSERVATIONS:



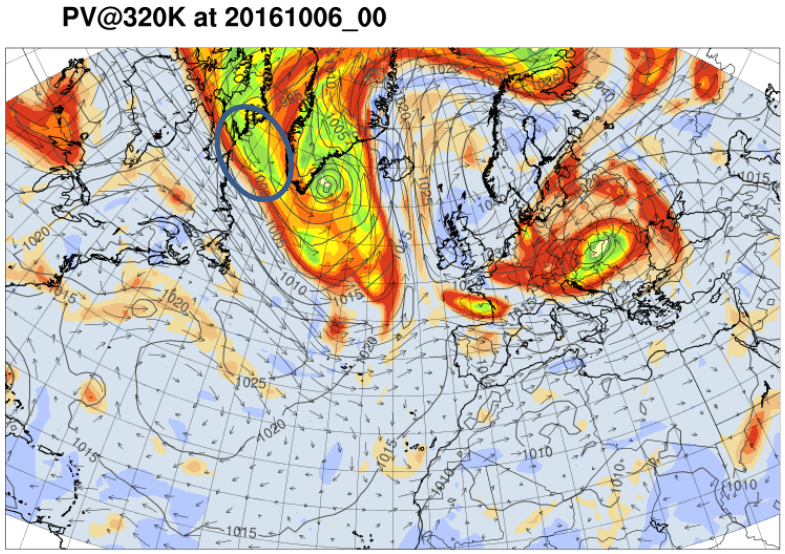
- Stronger wind than predicted by ECMWF ensemble, agreement with HARMONIE 2.5 km-resolution model.

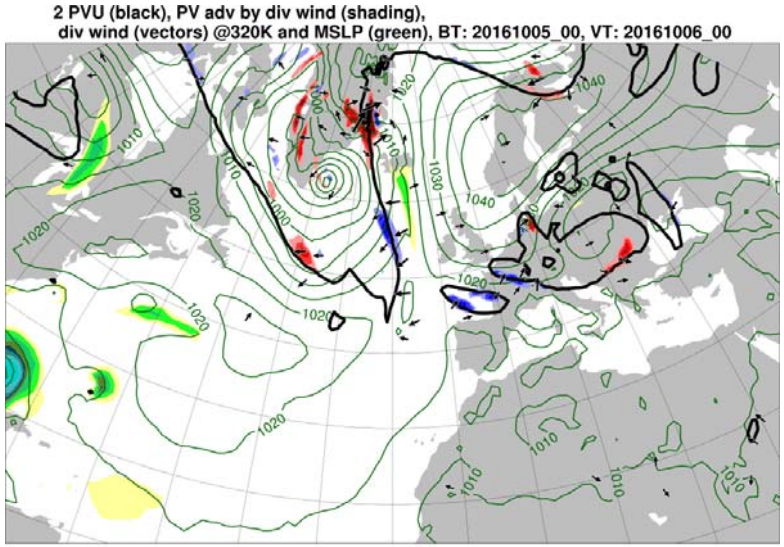
Heavy rain on Wed 5 Oct 2016

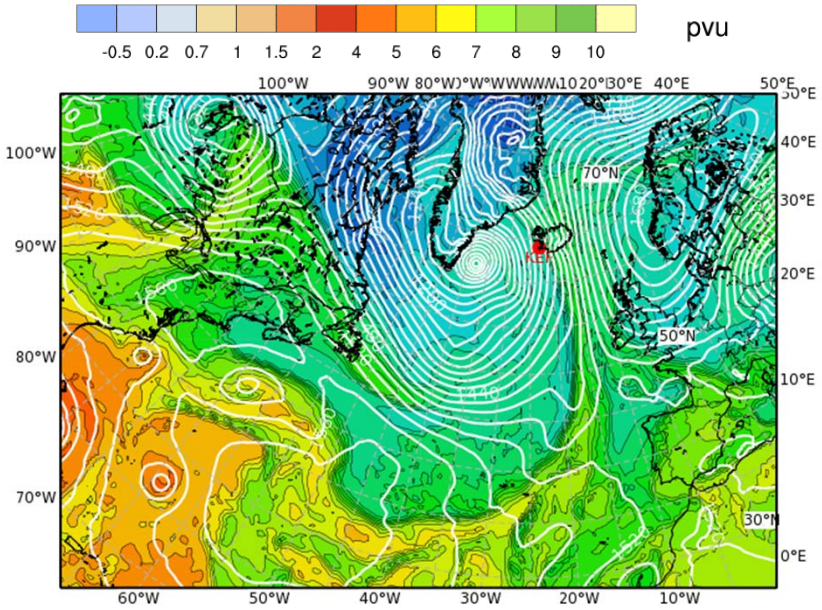


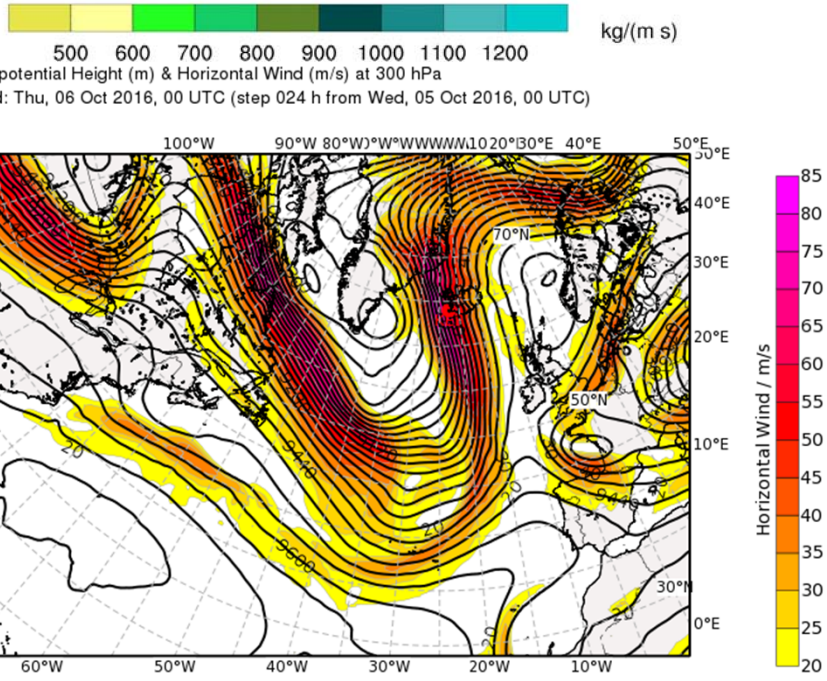


Forecast – Thu 6 Oct 2016, 00 UTC PV320K, irrwind320K, THE850K, trajectories

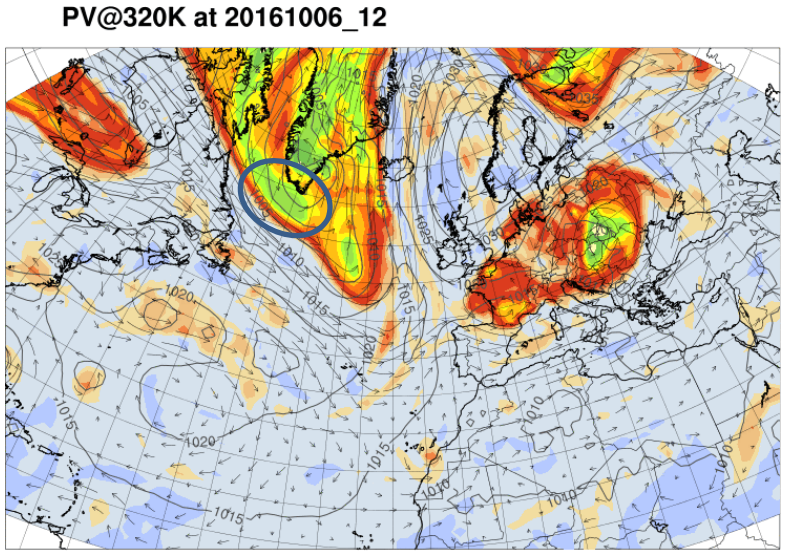


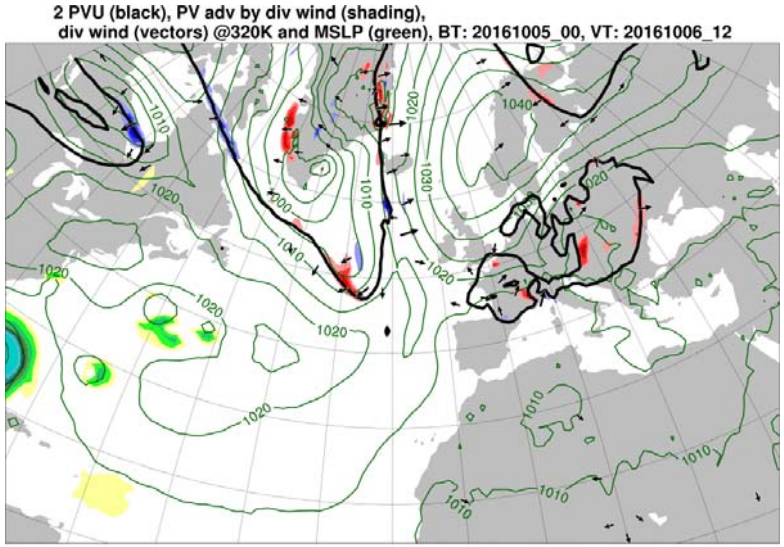


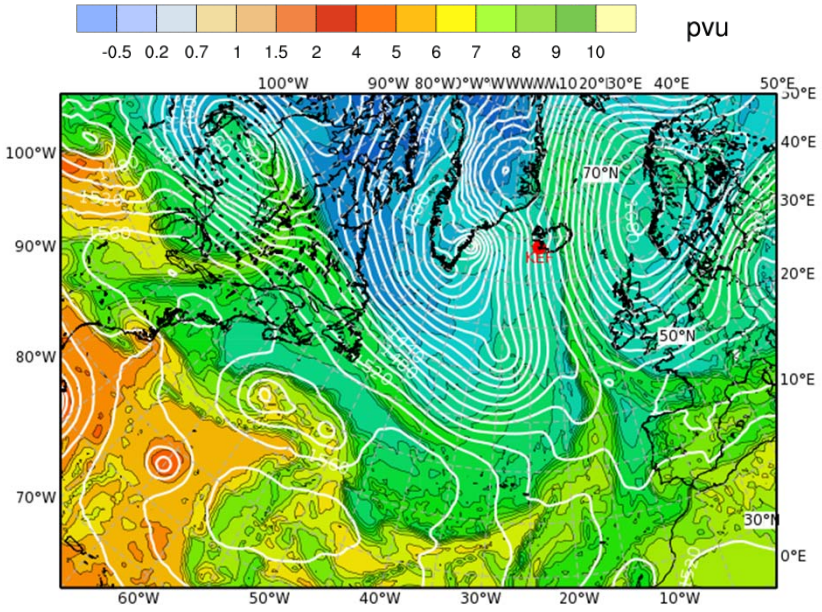




Forecast – Thu 6 Oct 2016, 12UTC PV320K, irrwind320K, THE850K, trajectories







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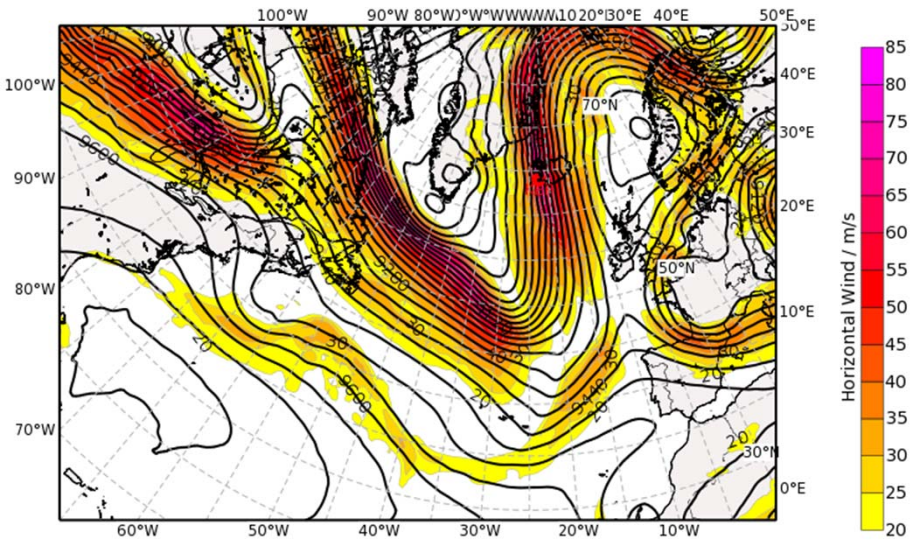
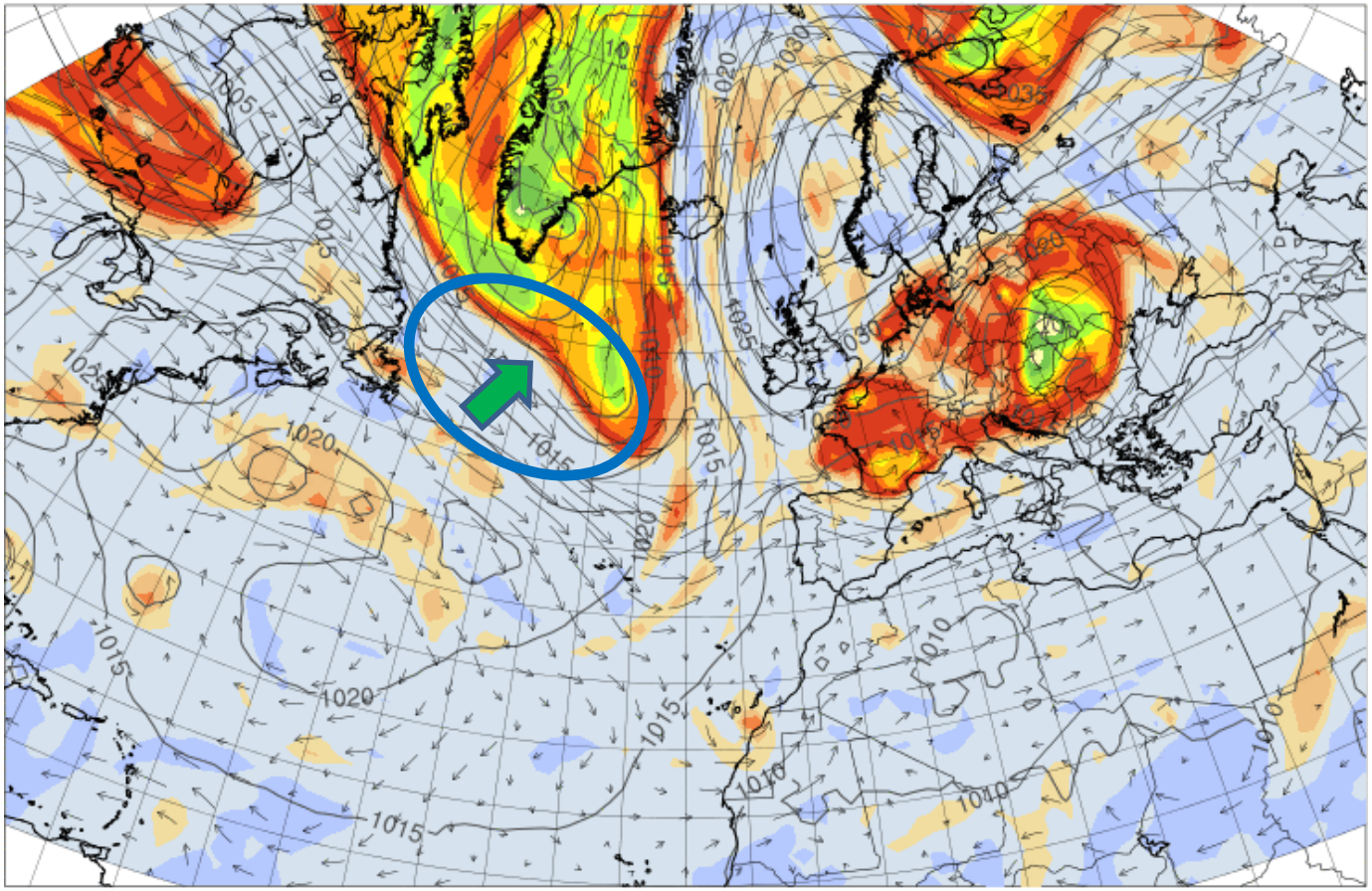
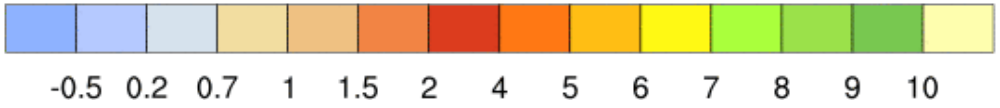


Tropopause Polar Vortices (TPVs)



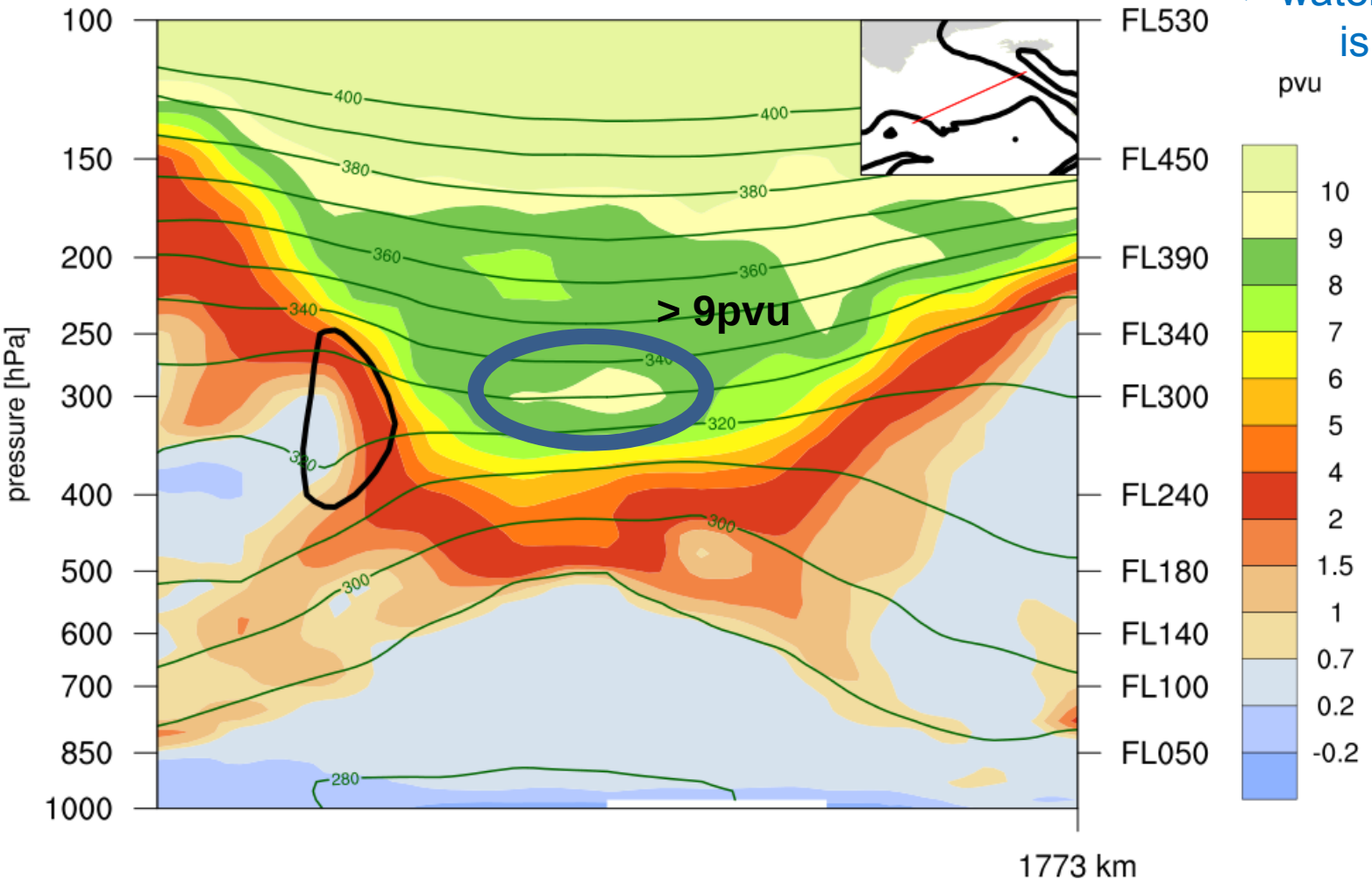
TPVs can induce tropopause ondulations and initiate RWI.

The balanced component of the flow is responsible of that.



Cross section at Fri 07/12UTC

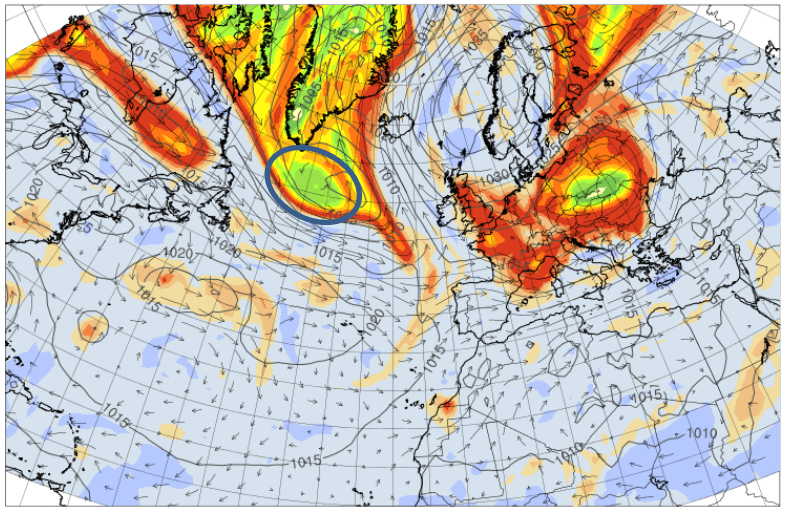
- Very high PV values.
- **Radiative processes drive the PV increase.**
  -> water vapor gradient is the key



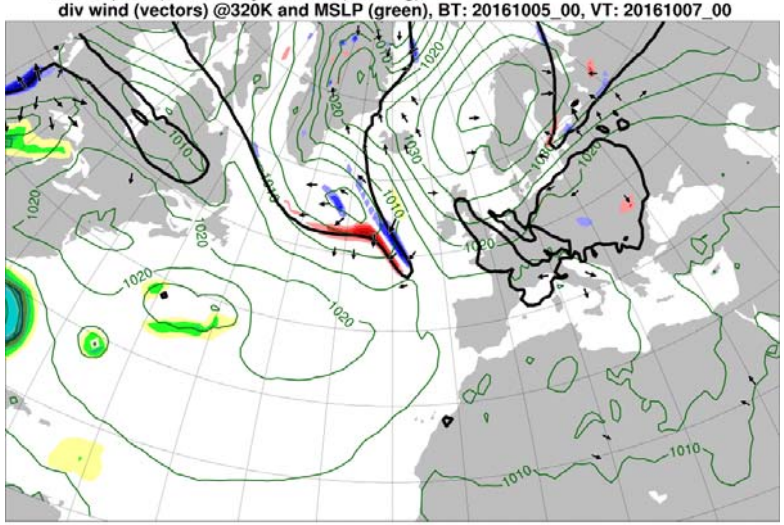
Forecast – Fri 7 Oct 2016, 00UTC

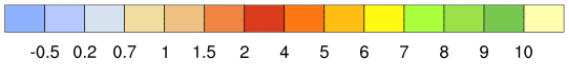
PV320K, irrwind320K, THE850K, trajectories

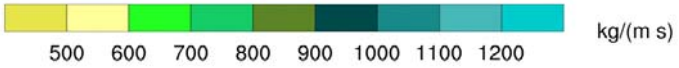
PV@320K at 20161007_00

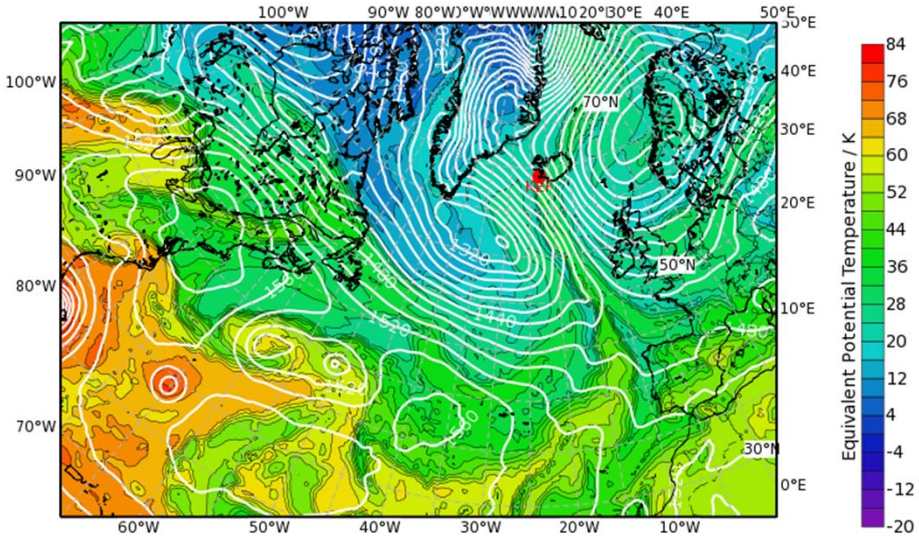


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161007_00

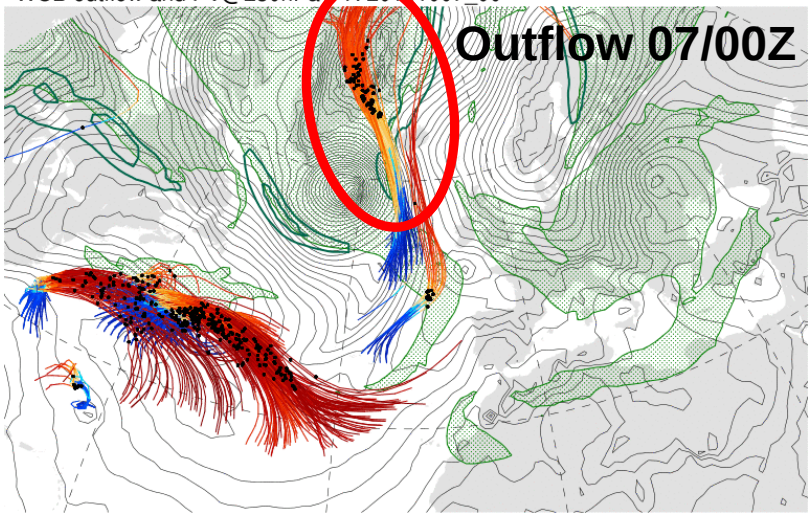








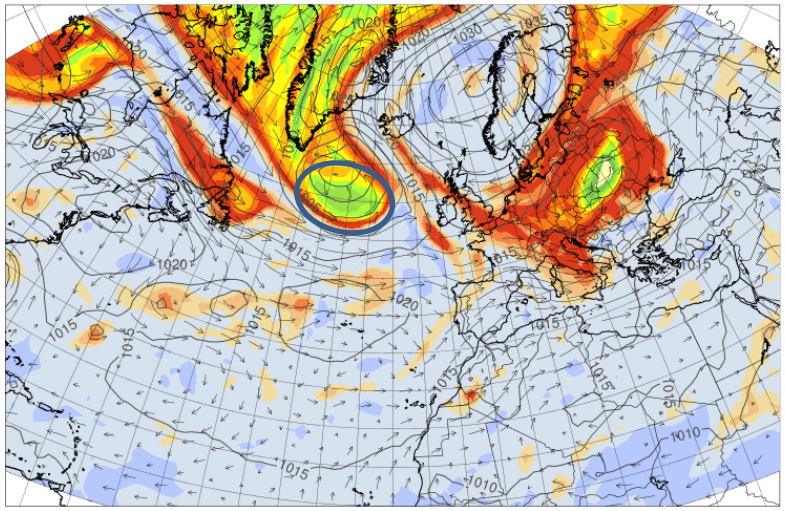
Trajectory start and SLP VT: 20161005_00
WCB outflow and PV@250hPa VT: 20161007_00



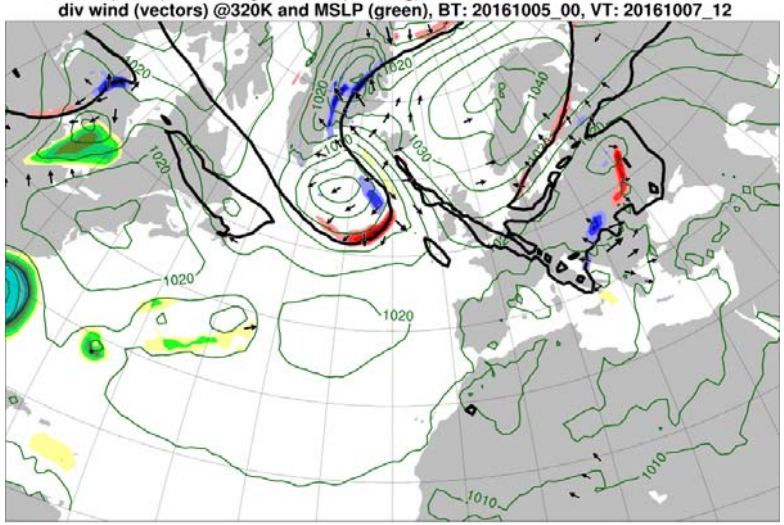
Forecast – Fri 7 Oct 2016, 12UTC

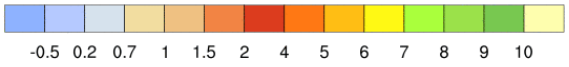
PV320K, irrwind320K, THE850K, trajectories

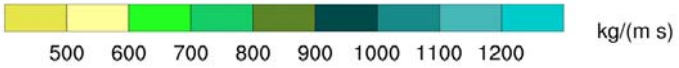
PV@320K at 20161007_12

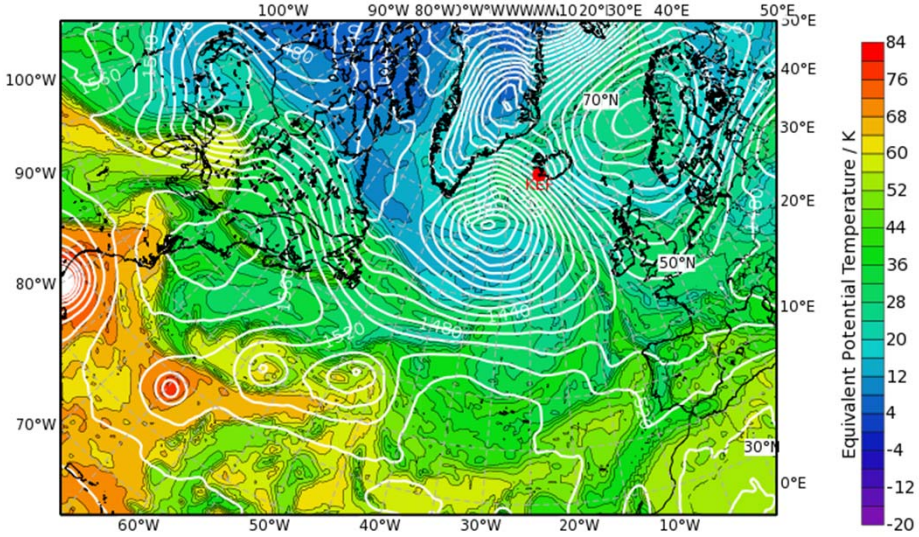


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161007_12

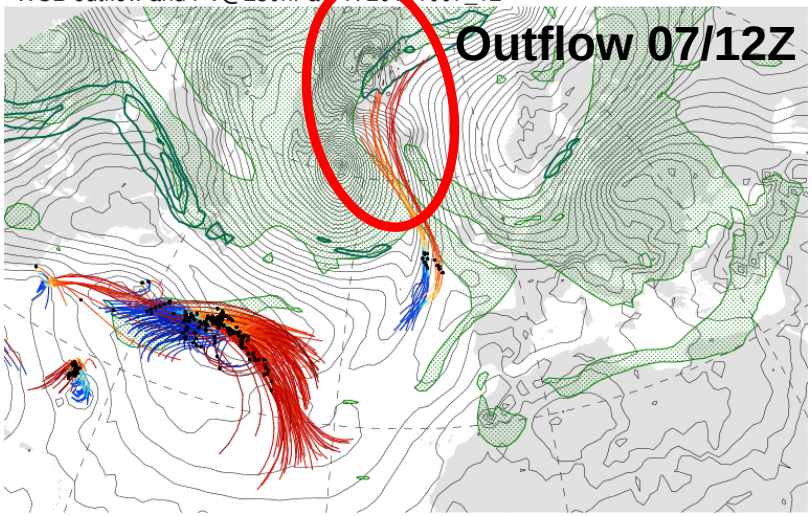




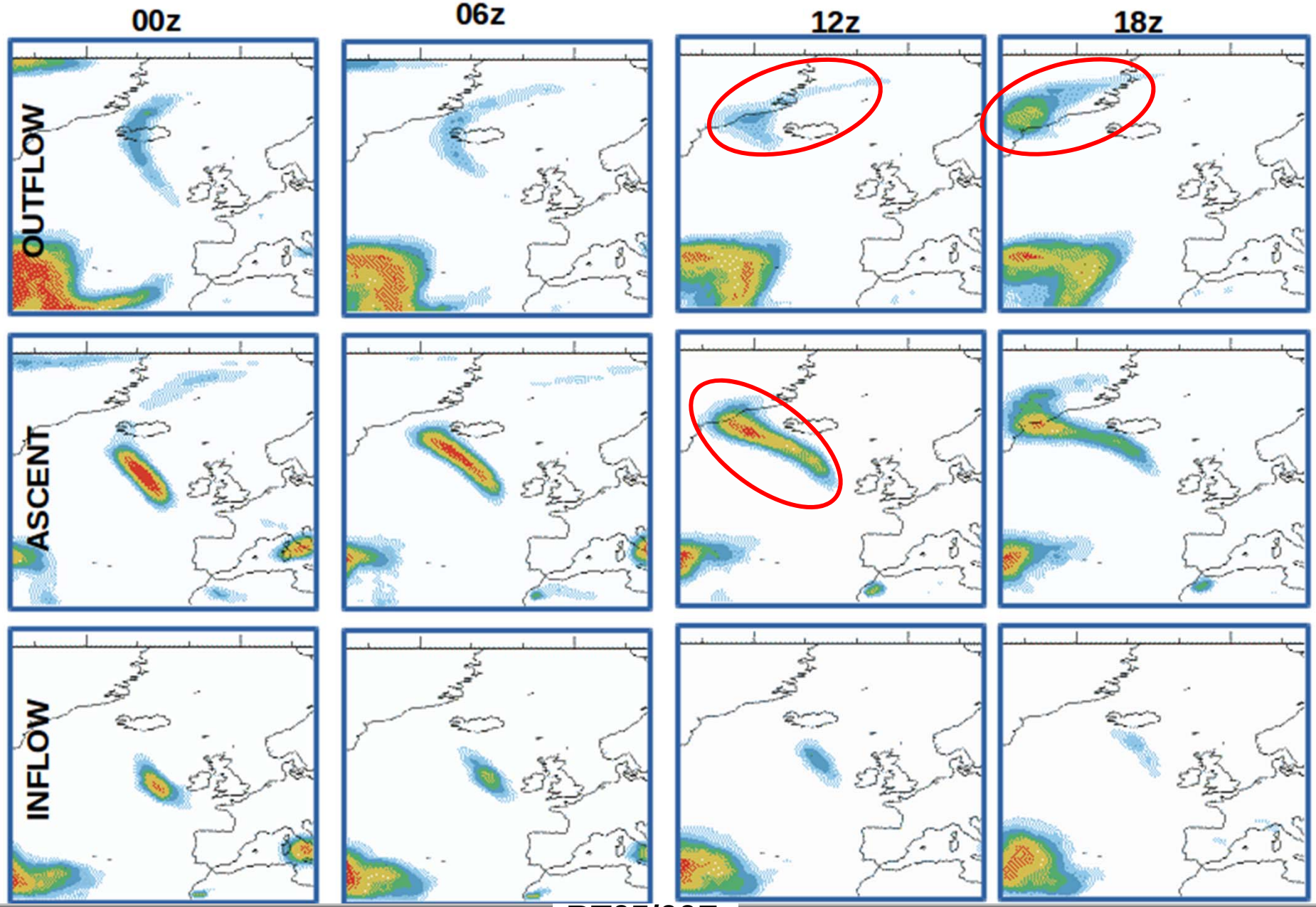




Trajectory start and SLP VT: 20161005_12
WCB outflow and PV@250hPa VT: 20161007_12

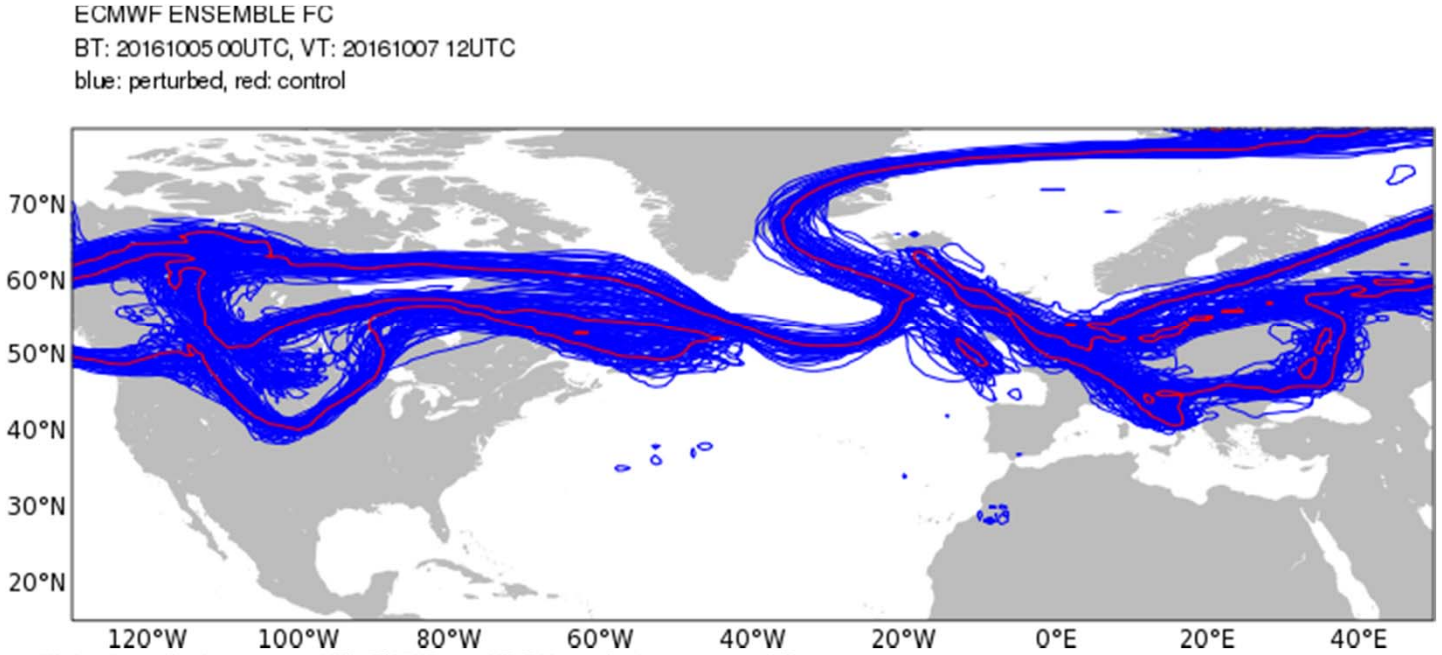


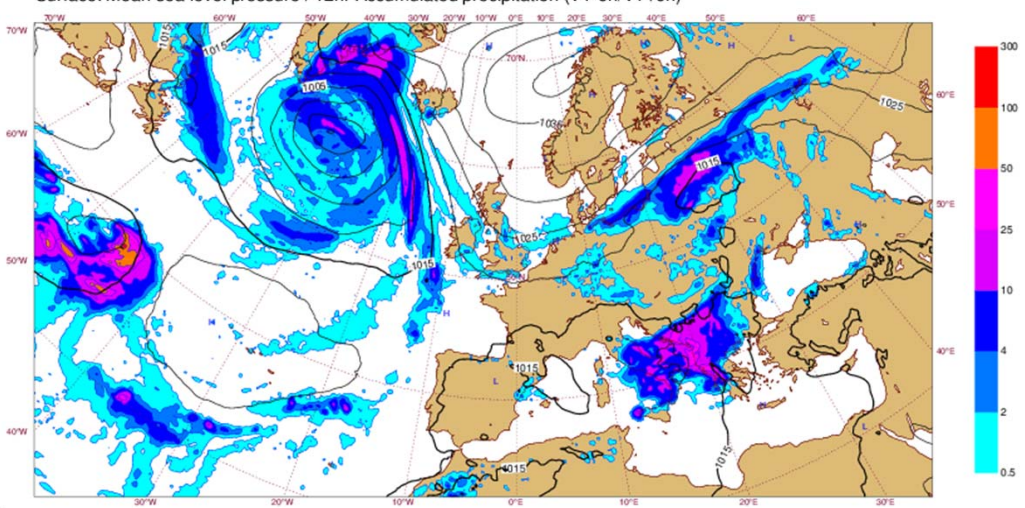
WCB Ens Probabilities Friday 7 Oct (BT: 05/00z)

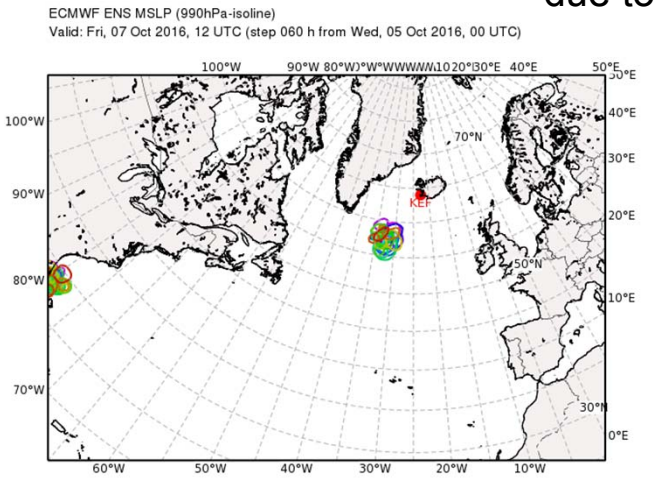


2PVU@320K, MSLP990 Spaghetti (based EC Ens 05/00Z)

Fri 07/12Z





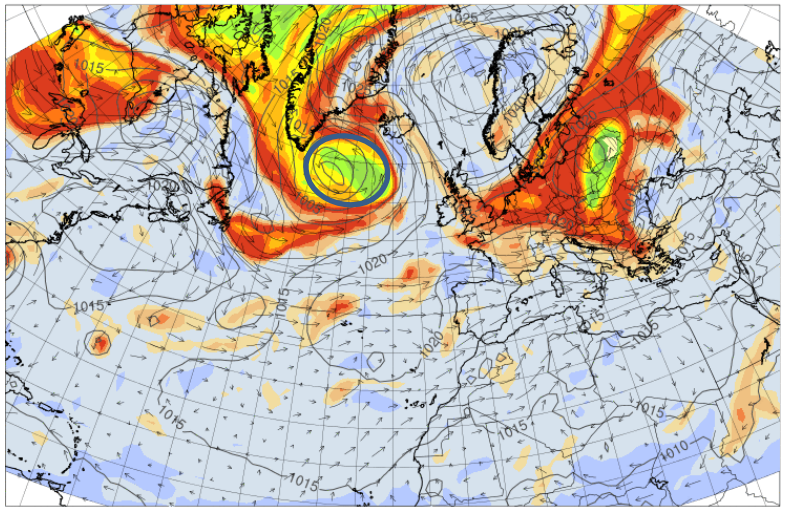


Low pressure development due to TPV.

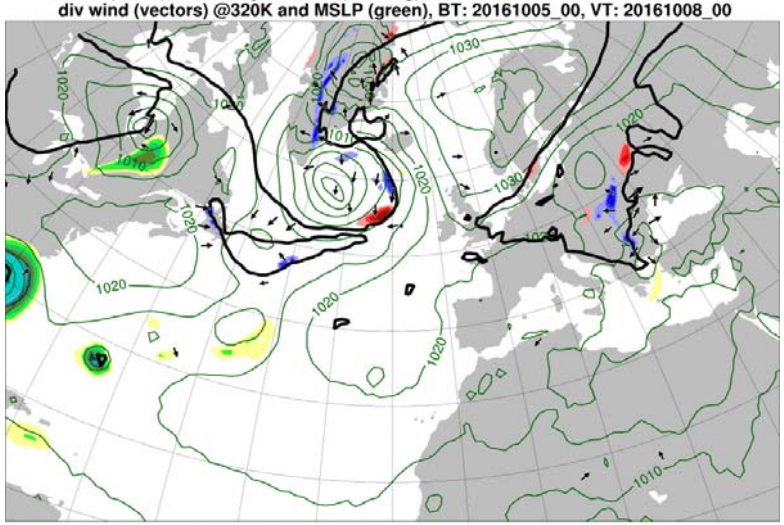
Forecast – Sat 8 Oct 2016, 00UTC

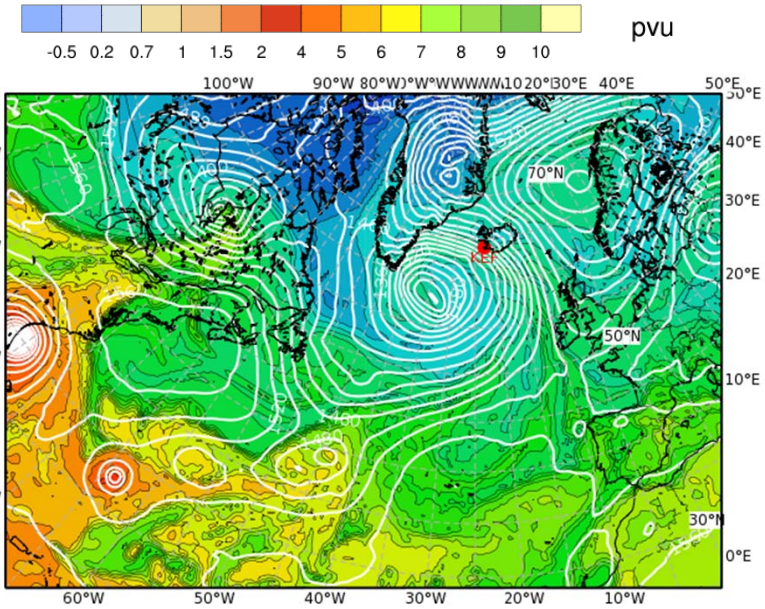
PV320K, irrwind320K, THE850K, trajectories

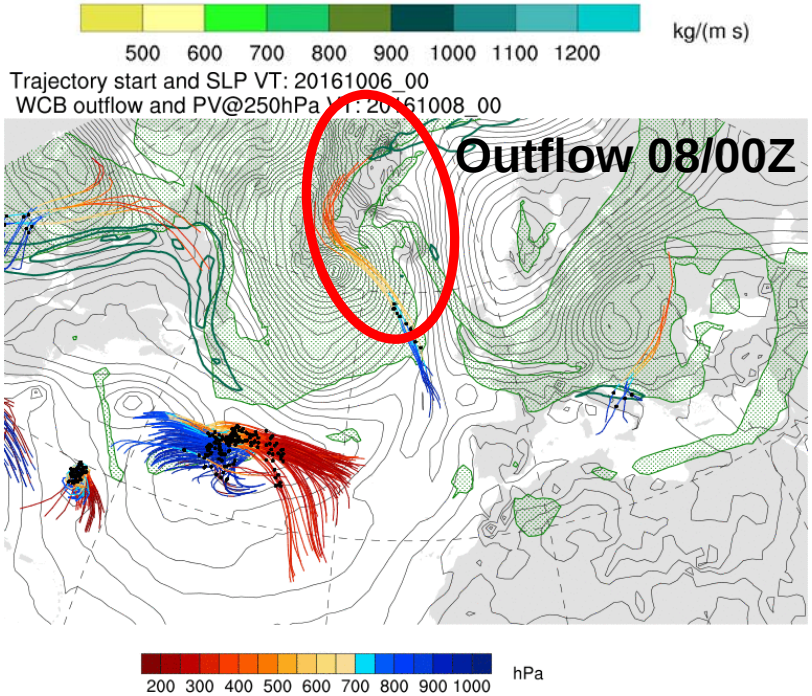
PV@320K at 20161008_00



2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161008_00



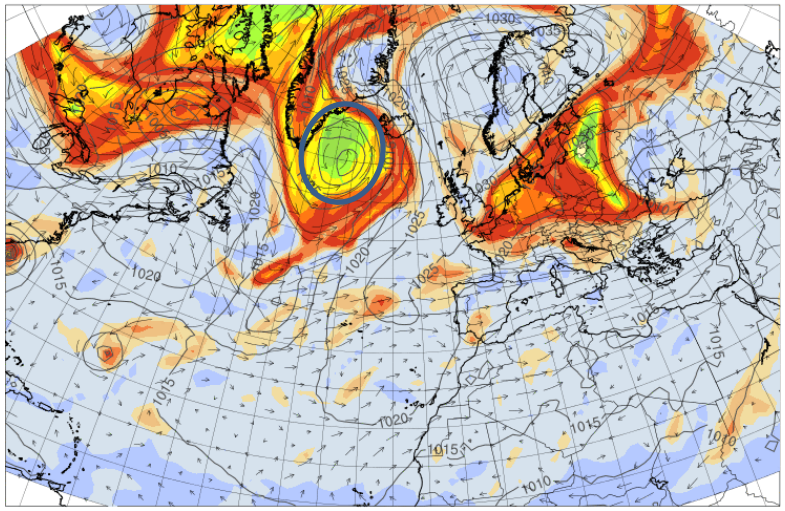




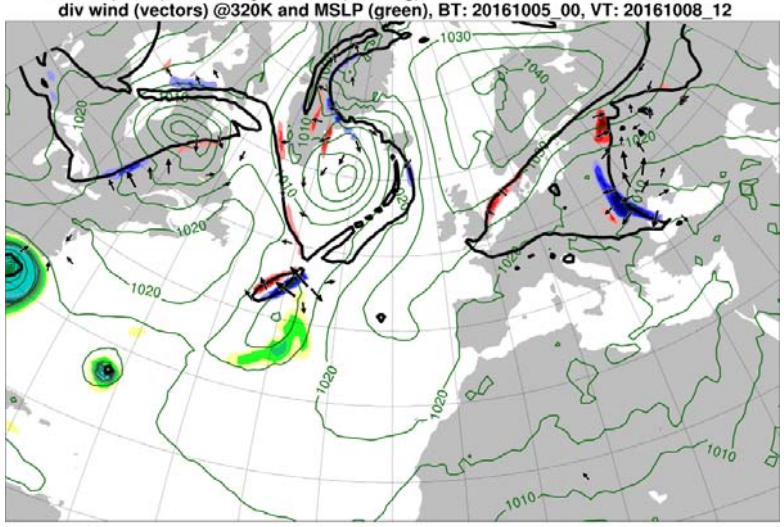
Forecast – Sat 8 Oct 2016, 12UTC

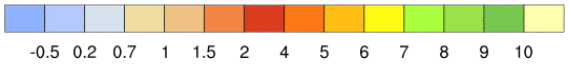
PV320K, irrwind320K, THE850K, trajectories

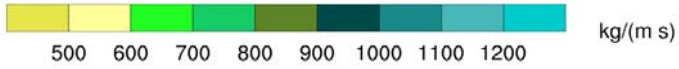
PV@320K at 20161008_12

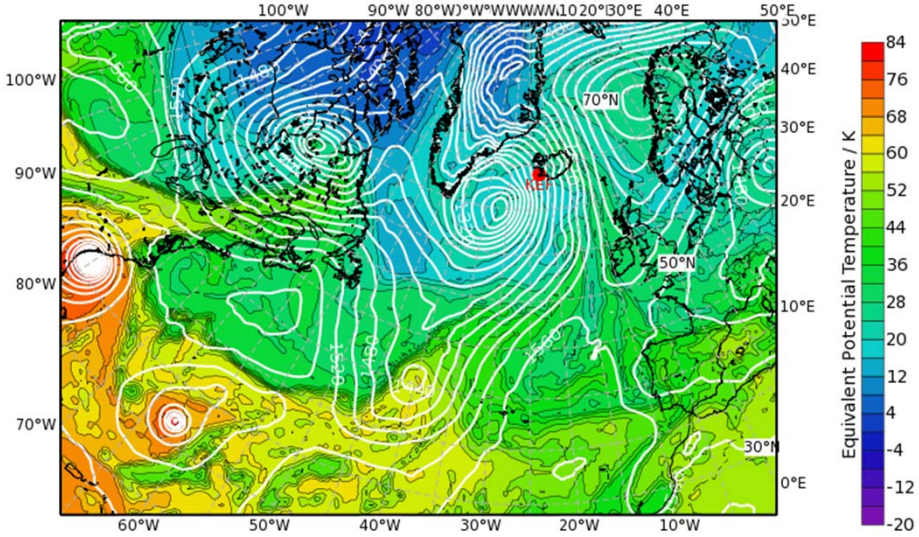


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161008_12

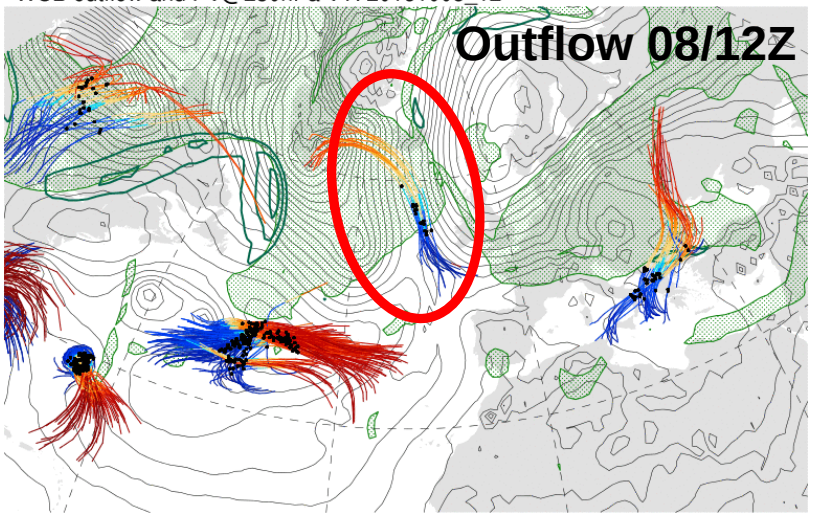






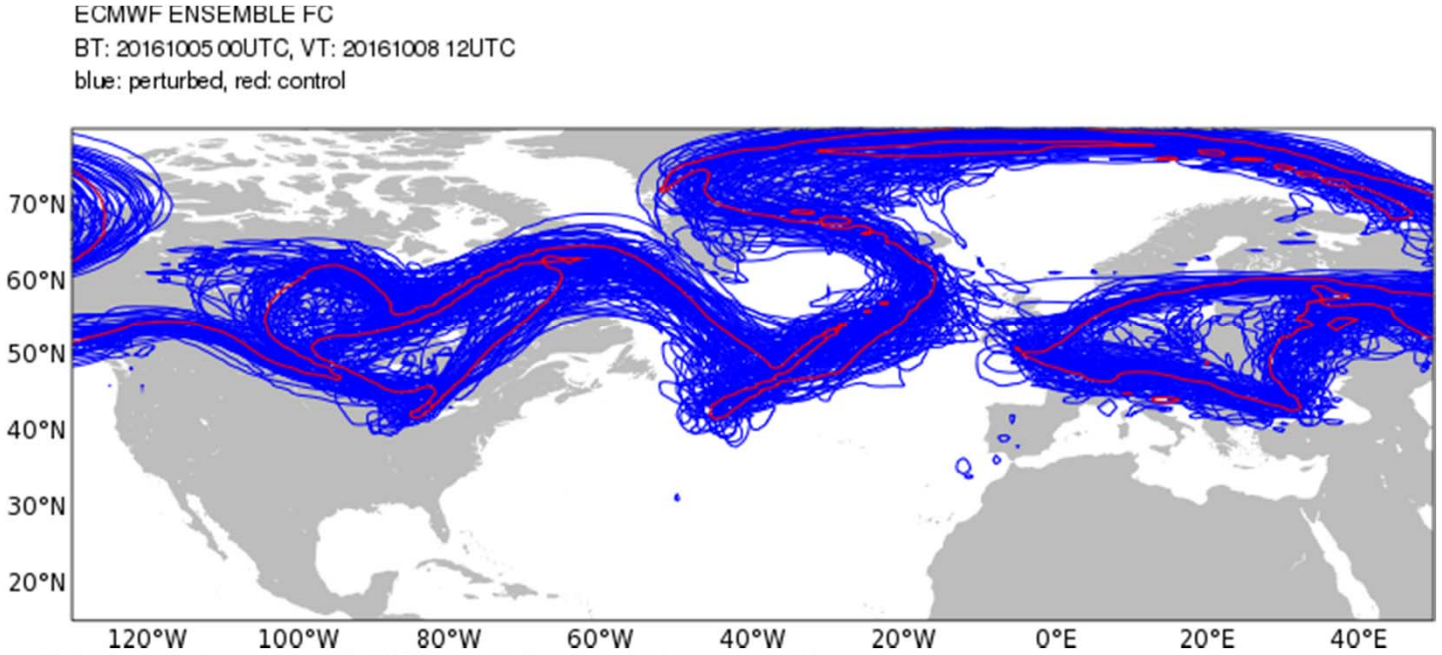


Trajectory start and SLP VT: 20161006_12
WCB outflow and PV@250hPa VT: 20161008_12

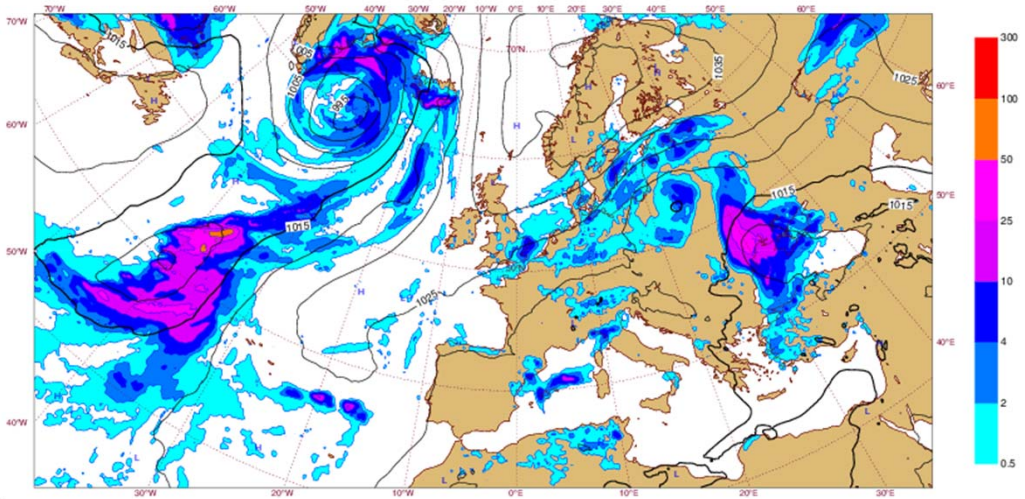


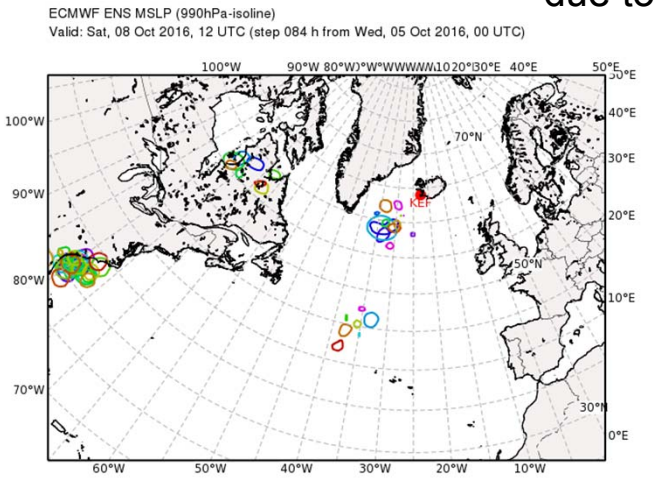
2PVU@320K, MSLP990 Spaghetti (based EC Ens 05/00Z)

Sat 08/12Z



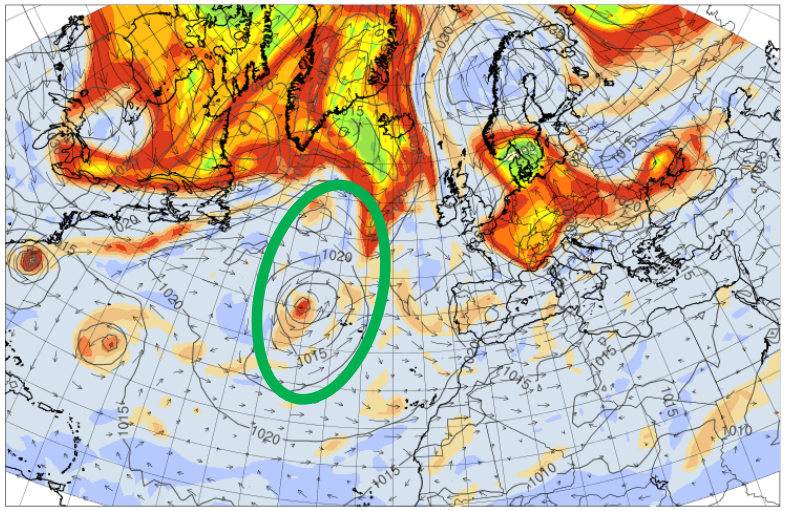
Low pressure development due to TPV.



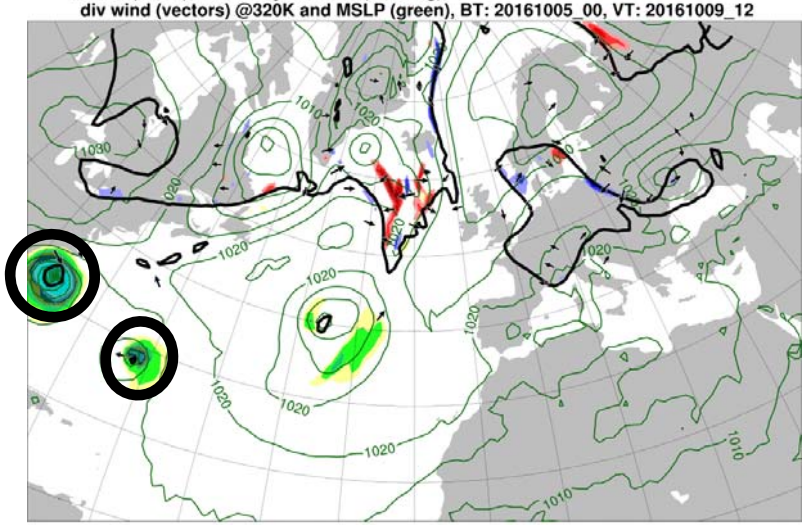


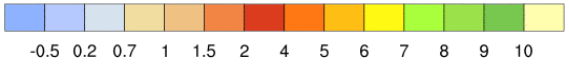
Forecast – Sun 9 Oct 2016, 12UTC PV320K, irrwind320K, THE850K, trajectories

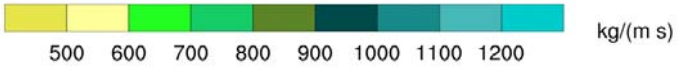
PV@320K at 20161009_12



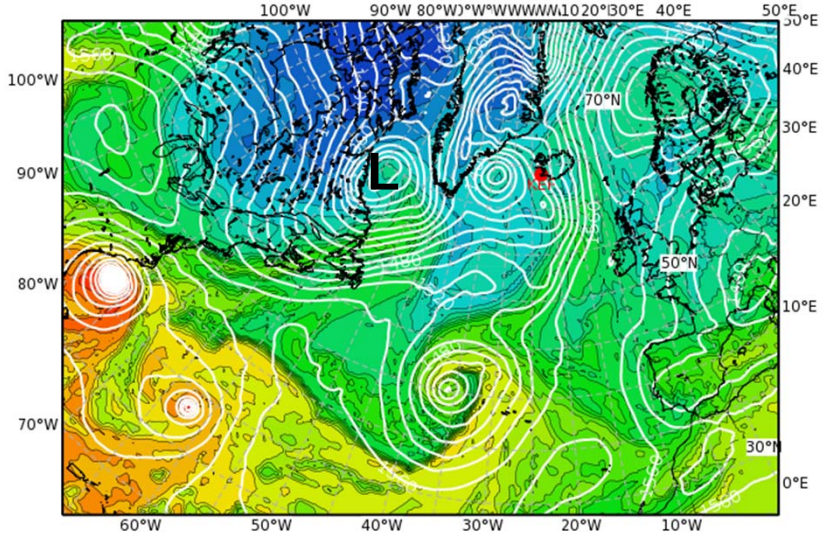
2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @320K and MSLP (green), BT: 20161005_00, VT: 20161009_12

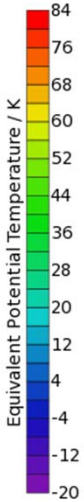


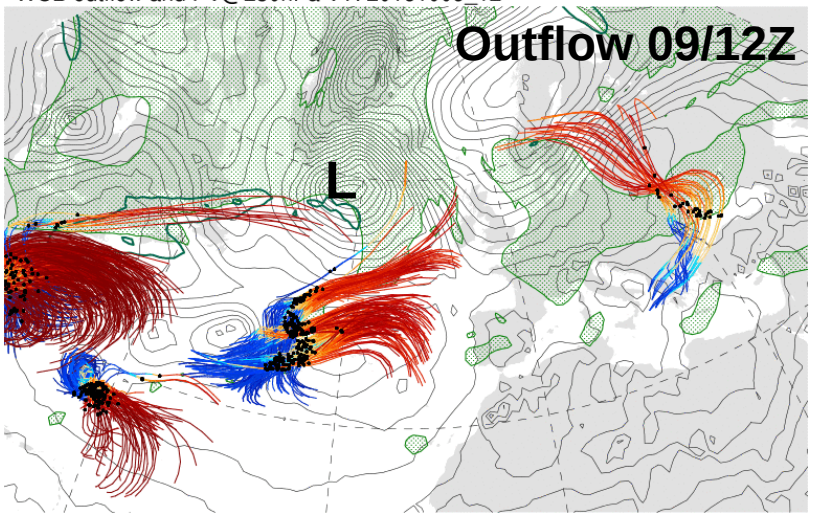




Trajectory start and SLP VT: 20161007_12
WCB outflow and PV@250hPa VT: 20161009_12

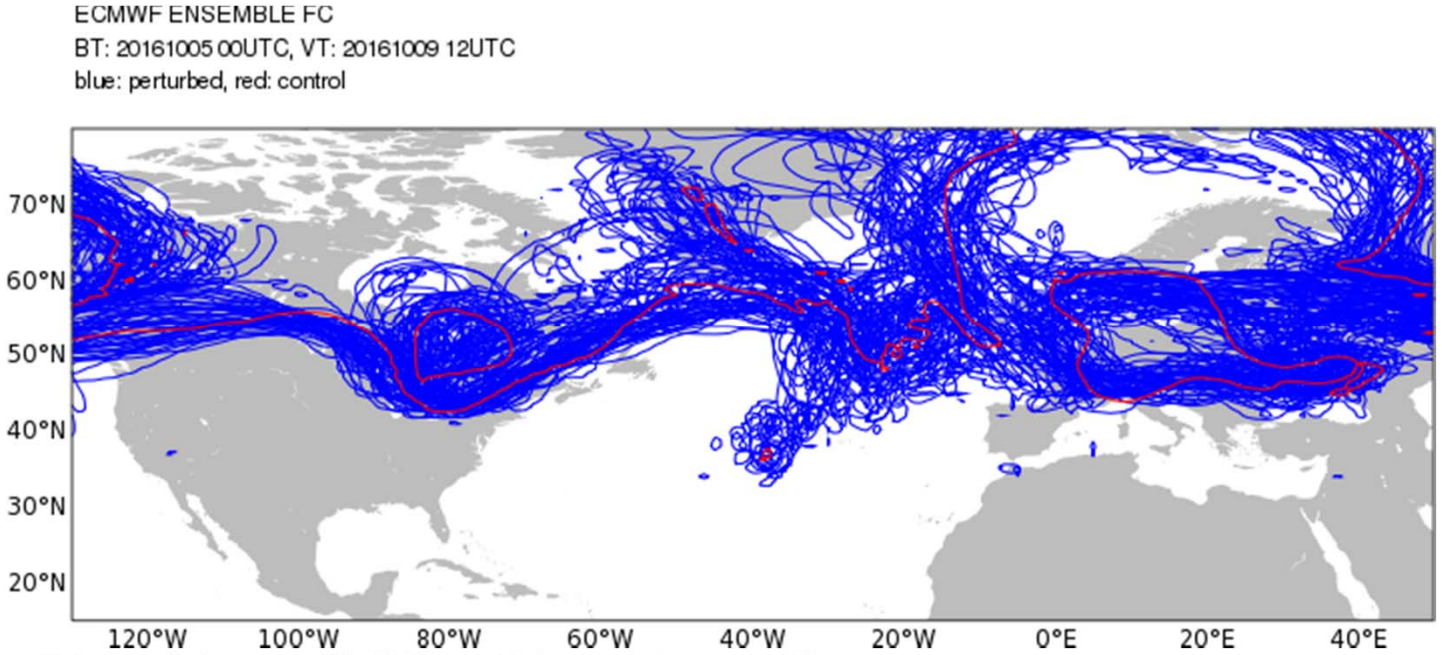


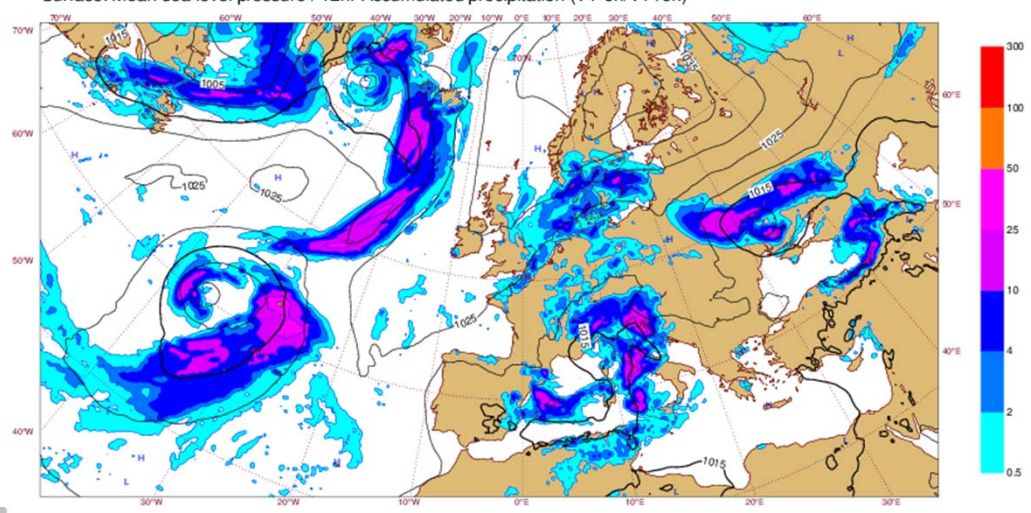


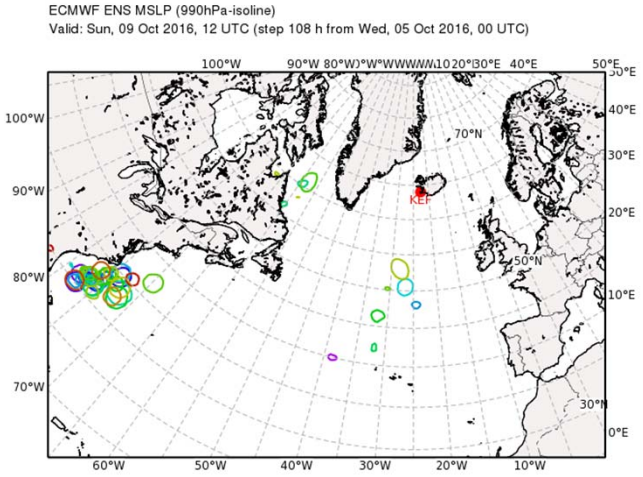


2PVU@320K, MSLP990 Spaghetti (based EC Ens 05/00Z)

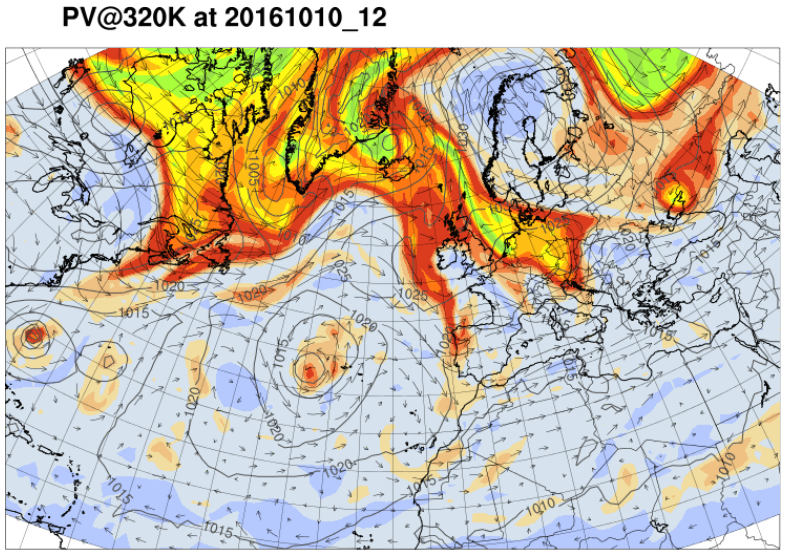
Sun 09/12Z

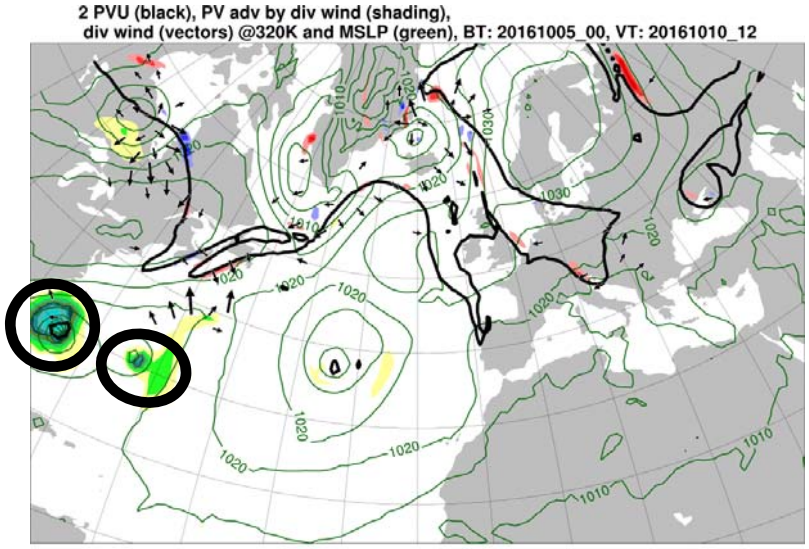


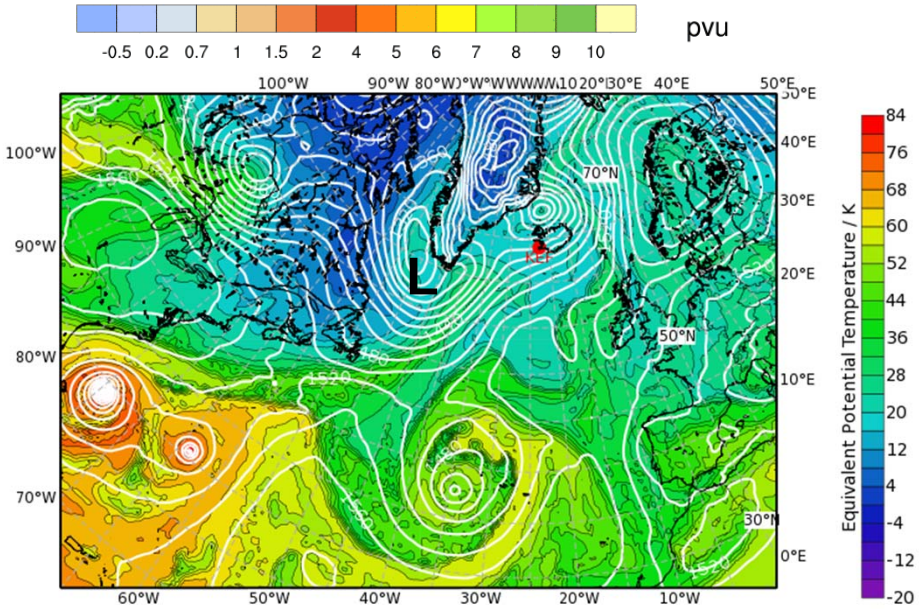


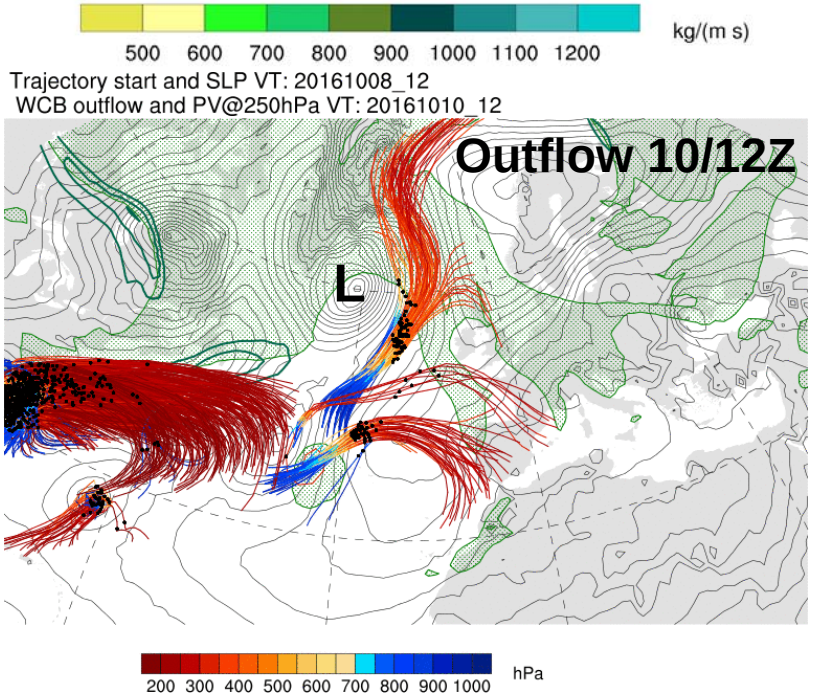


Forecast – Mon 10 Oct 2016, 12UTC PV320K, irrwind320K, THE850K, trajectories



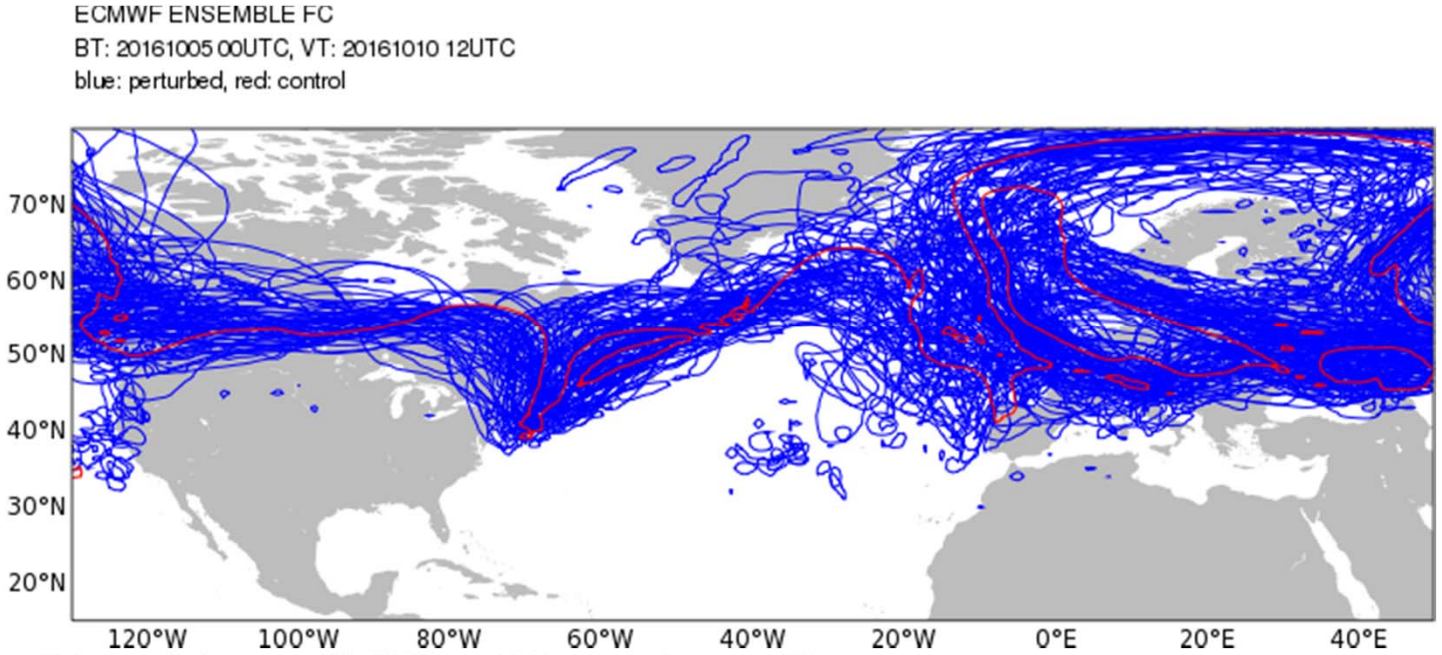




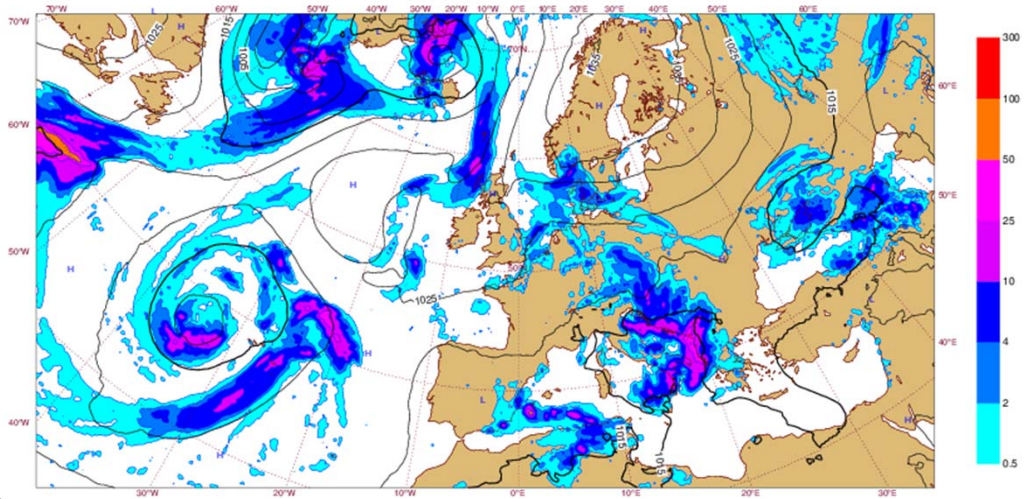


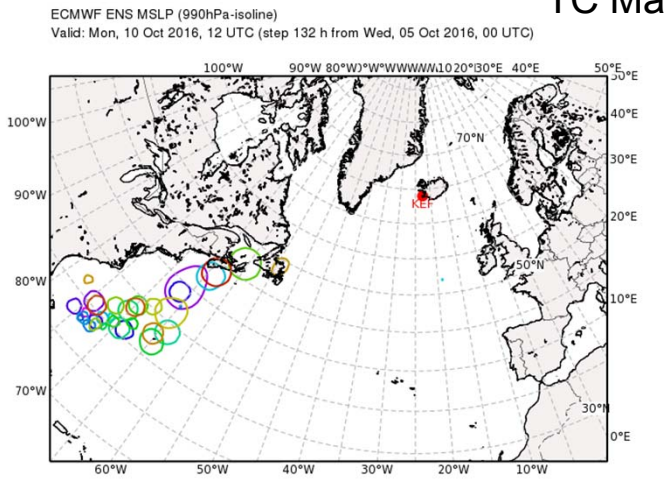
2PVU@320K, MSLP990 Spaghetti (based EC Ens 05/00Z)

Mon 10/12Z



Uncertainty on position of TC Matthew.





Outlook Mon 10 -> Wed 12

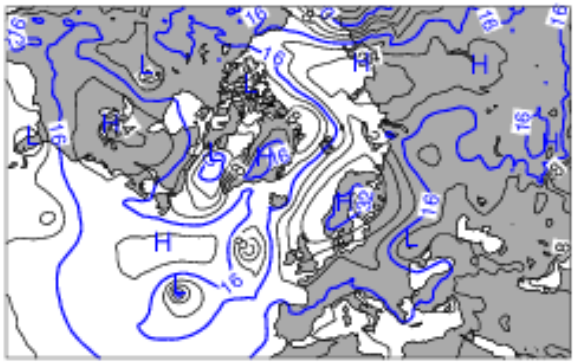
Ensembles cluster towards two scenarios:

1) No ET of Matthew, still southerly flow over Iceland with some diabatic activity.

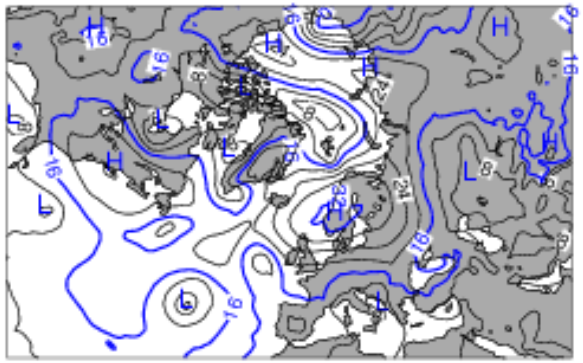
2) ET of Matthew and movement to Iceland by mid next week.

Wednesday 5 October 2016 00UTC ECMWF EPS Cluster scenario - 1000 hPa Geopotential
Reference step t+120-168 Based on the 500hPa Geopotential Clustering

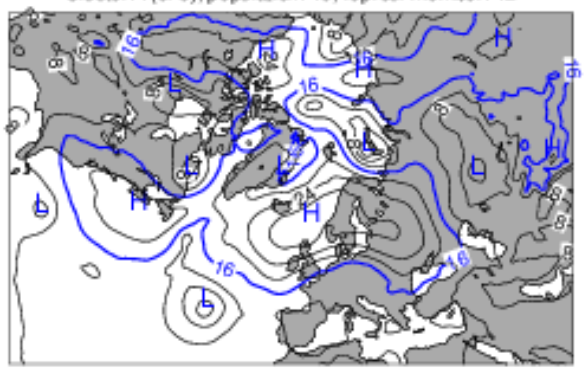
forecast t+120 VT:Monday 10 October 2016 00UTC
Cluster: 1(of 3), population: 19, repres. member: 12



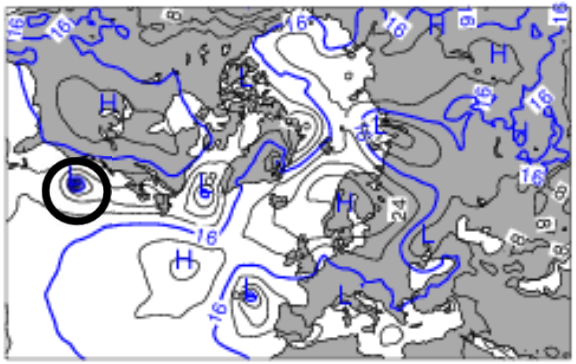
forecast t+144 VT:Tuesday 11 October 2016 00UTC
Cluster: 1(of 3), population: 19, repres. member: 12



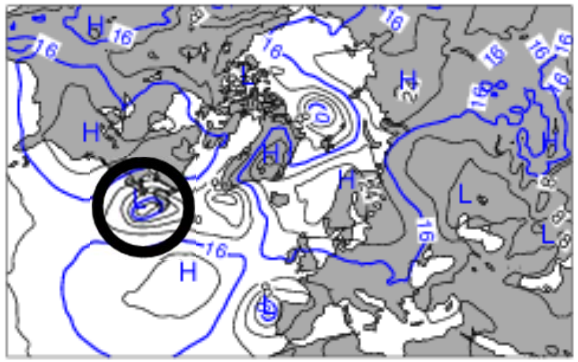
forecast t+168 VT:Wednesday 12 October 2016 00UTC
Cluster: 1(of 3), population: 19, repres. member: 12



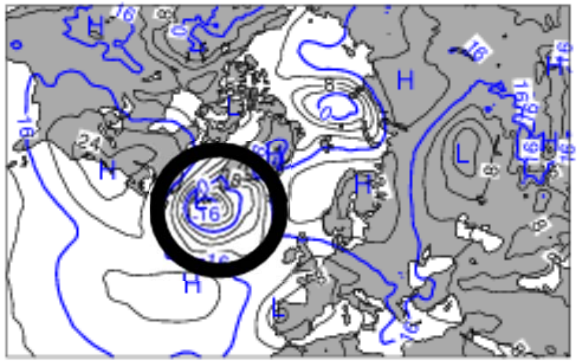
forecast t+120 VT:Monday 10 October 2016 00UTC
Cluster: 2(of 3), population: 16, repres. member: 16



forecast t+144 VT:Tuesday 11 October 2016 00UTC
Cluster: 2(of 3), population: 16, repres. member: 16



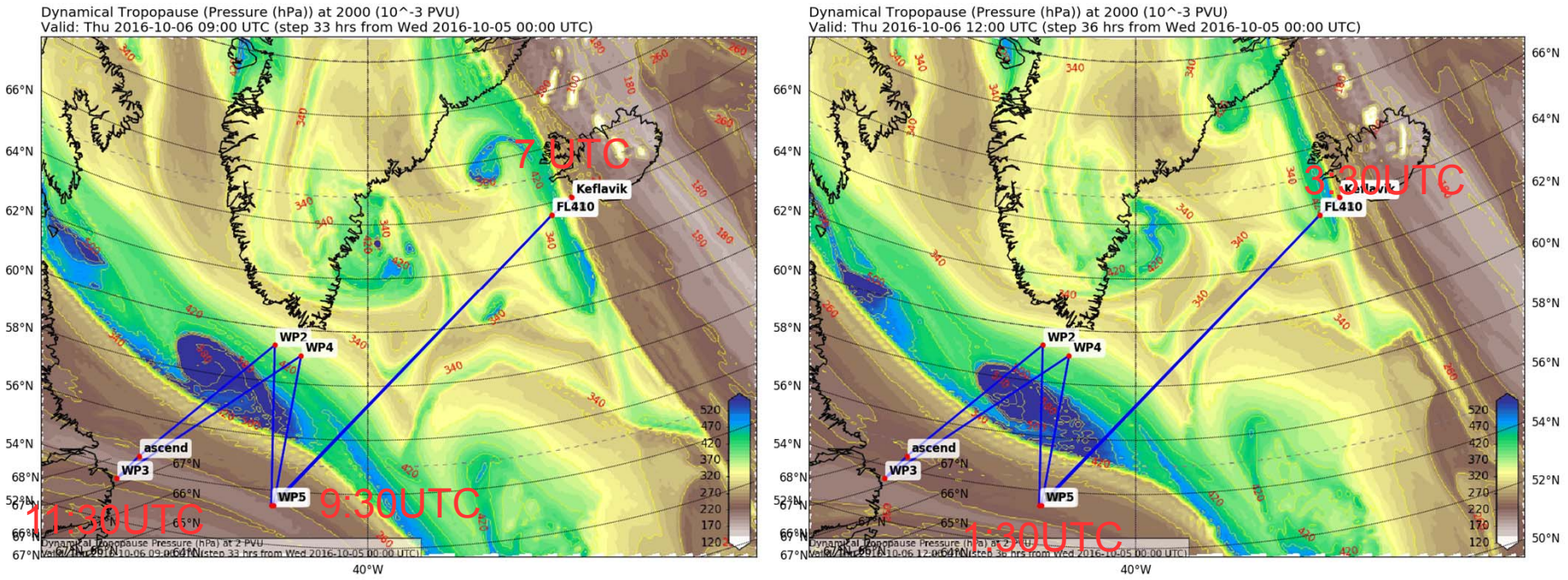
forecast t+168 VT:Wednesday 12 October 2016 00UTC
Cluster: 2(of 3), population: 16, repres. member: 16



HALO

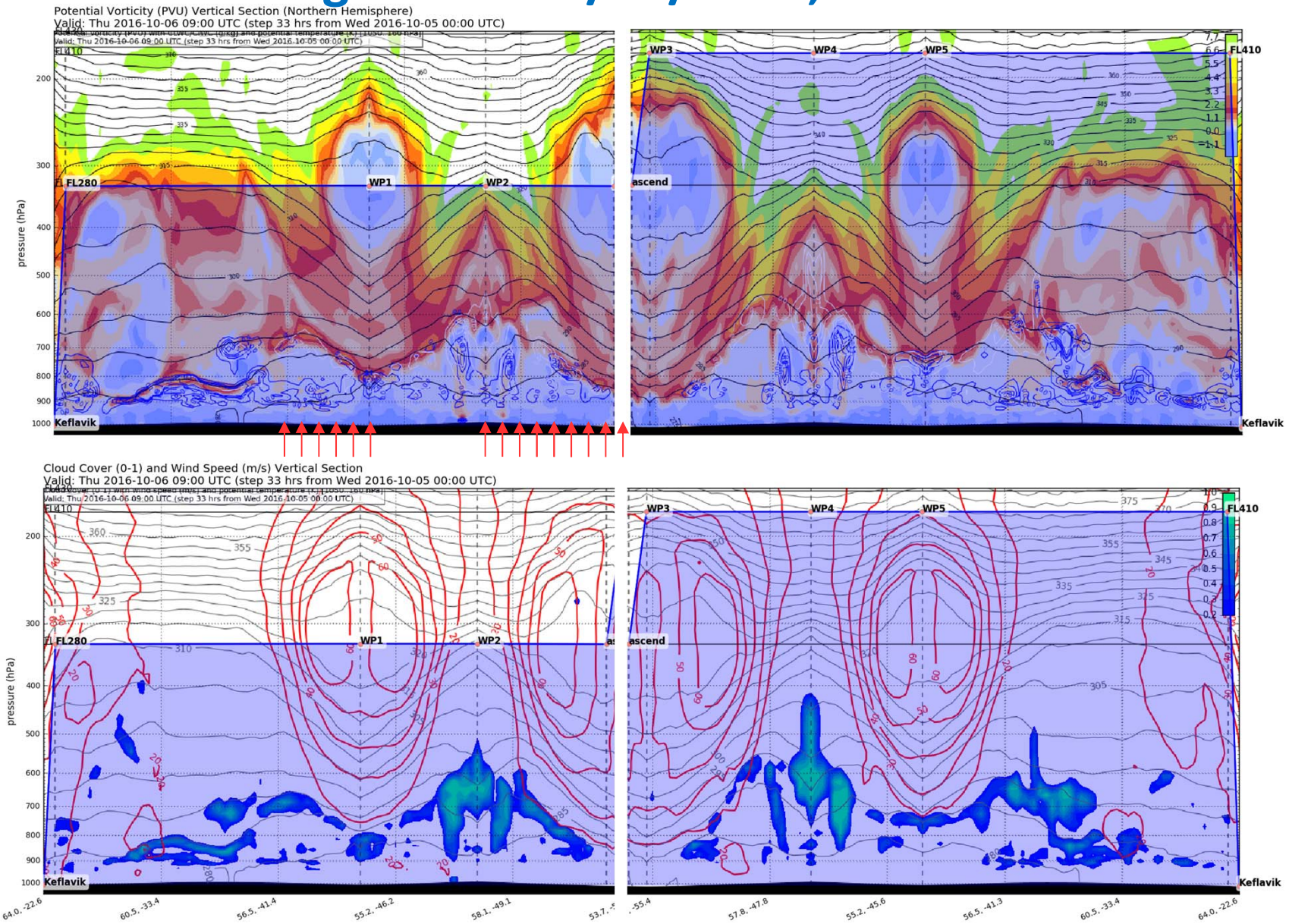
Thursday 06 Oct. flight

HALO flighttrack 06/10/2016, 0700-1530Z

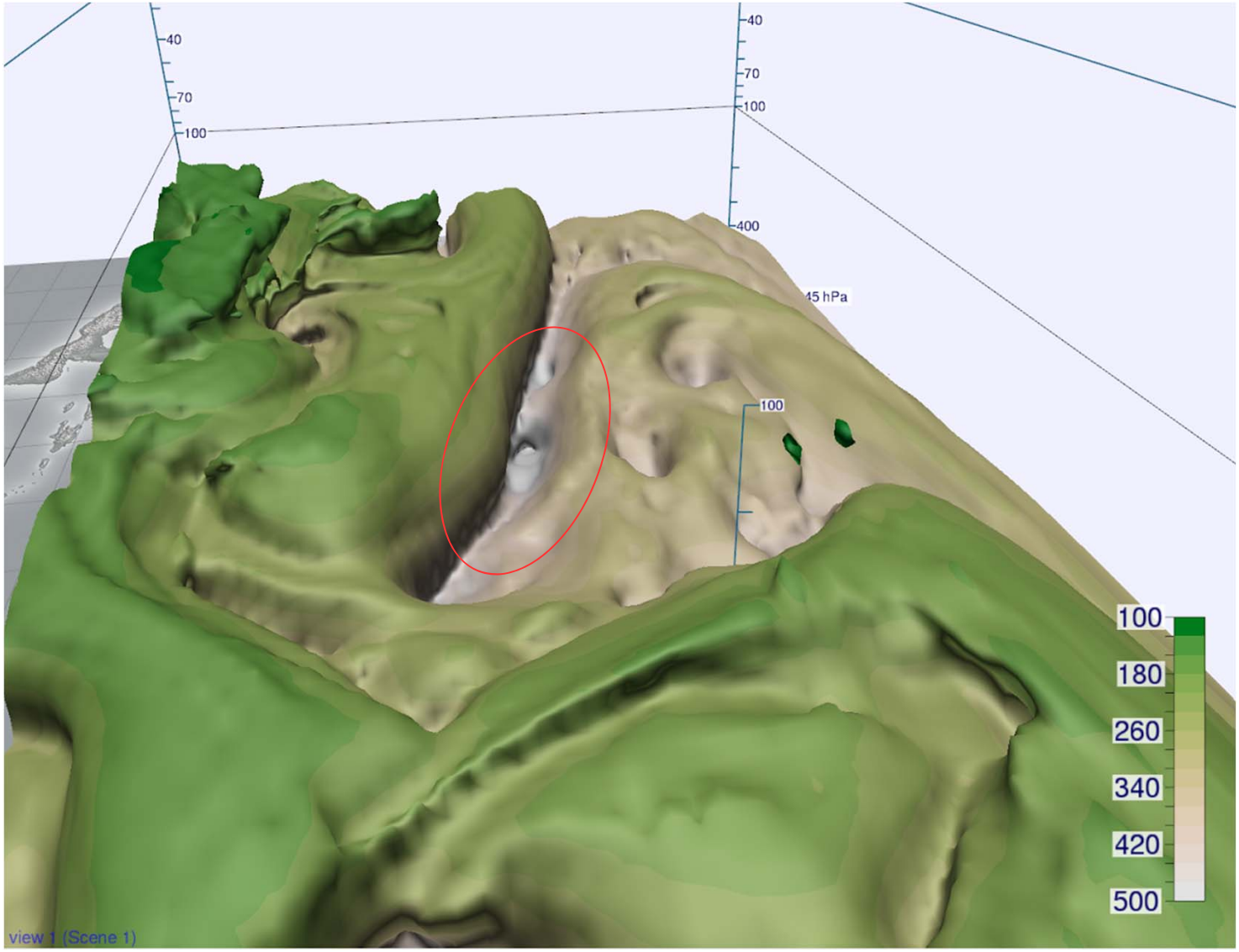


- Moisture gradient across deep tropopause fold and below TPV
- Lagrangian tracking of TPV with downstream flights on Friday
- Dropsondes across tropopause fold/TPV
- → measurements in region where TPV interacts with waveguide

HALO flighttrack 06/10/2016, 0700-1530Z



HALO flighttrack 06/10/2016, 0700-1530Z

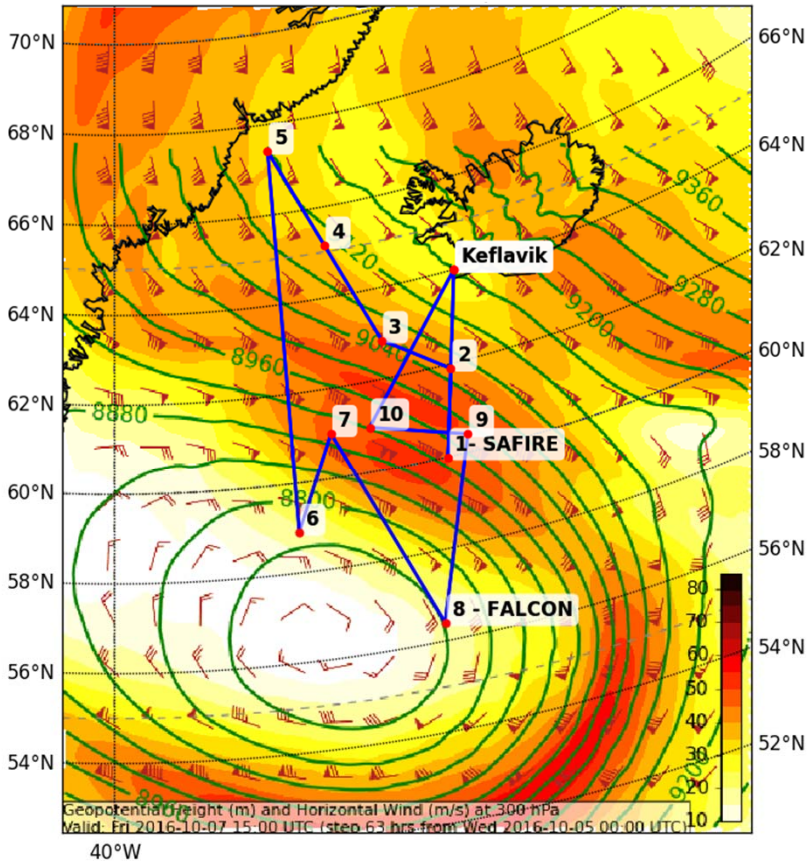


HALO

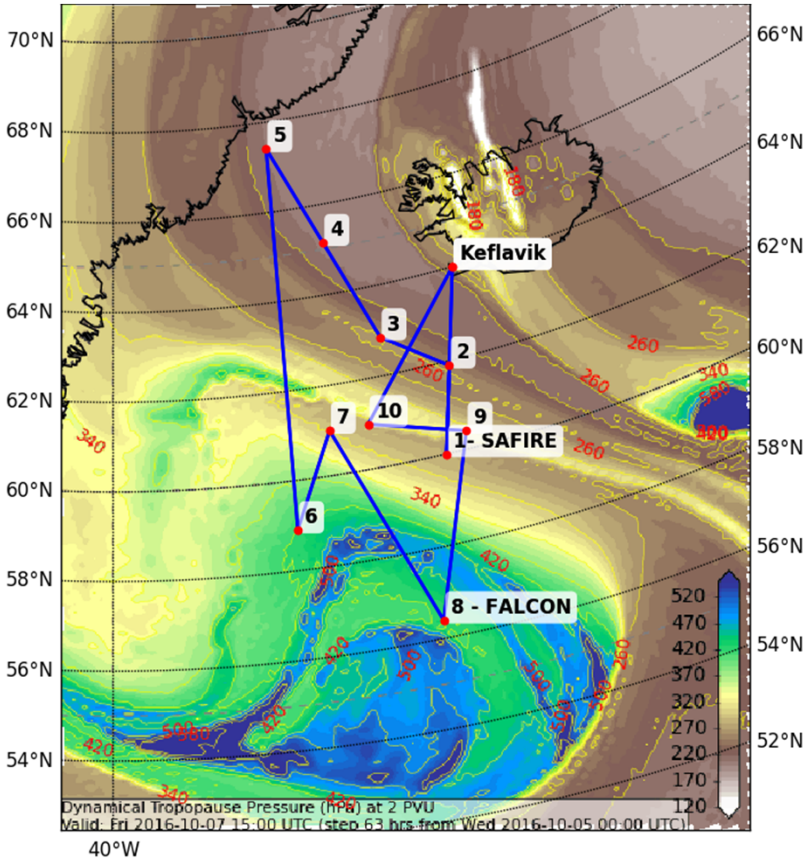
Friday 07 Oct. flight

Friday 7 October HALO flight

Geopot (m) & Hor Wind (m/s) at 300 hPa



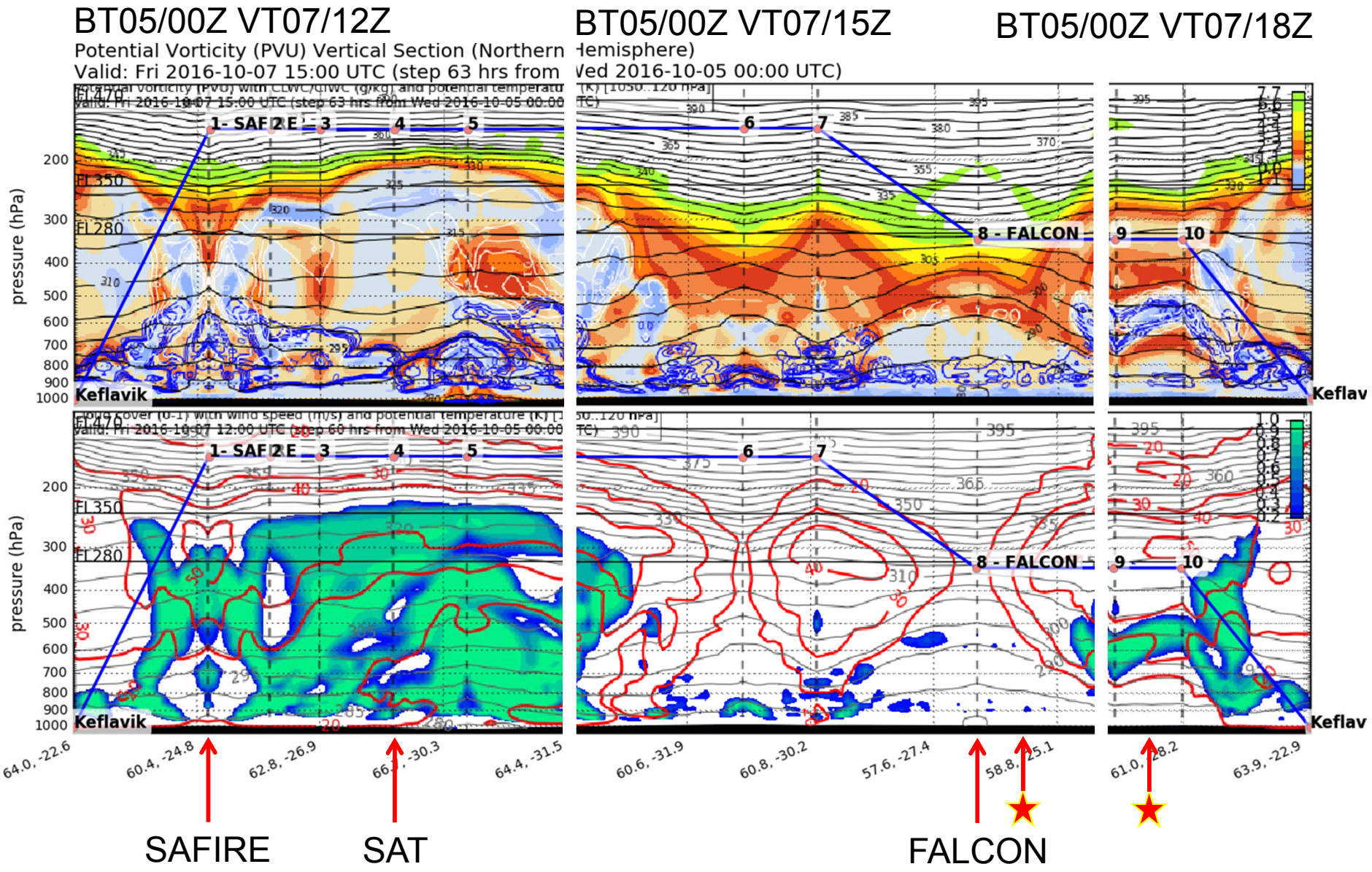
P (hPa) at 2 PVU



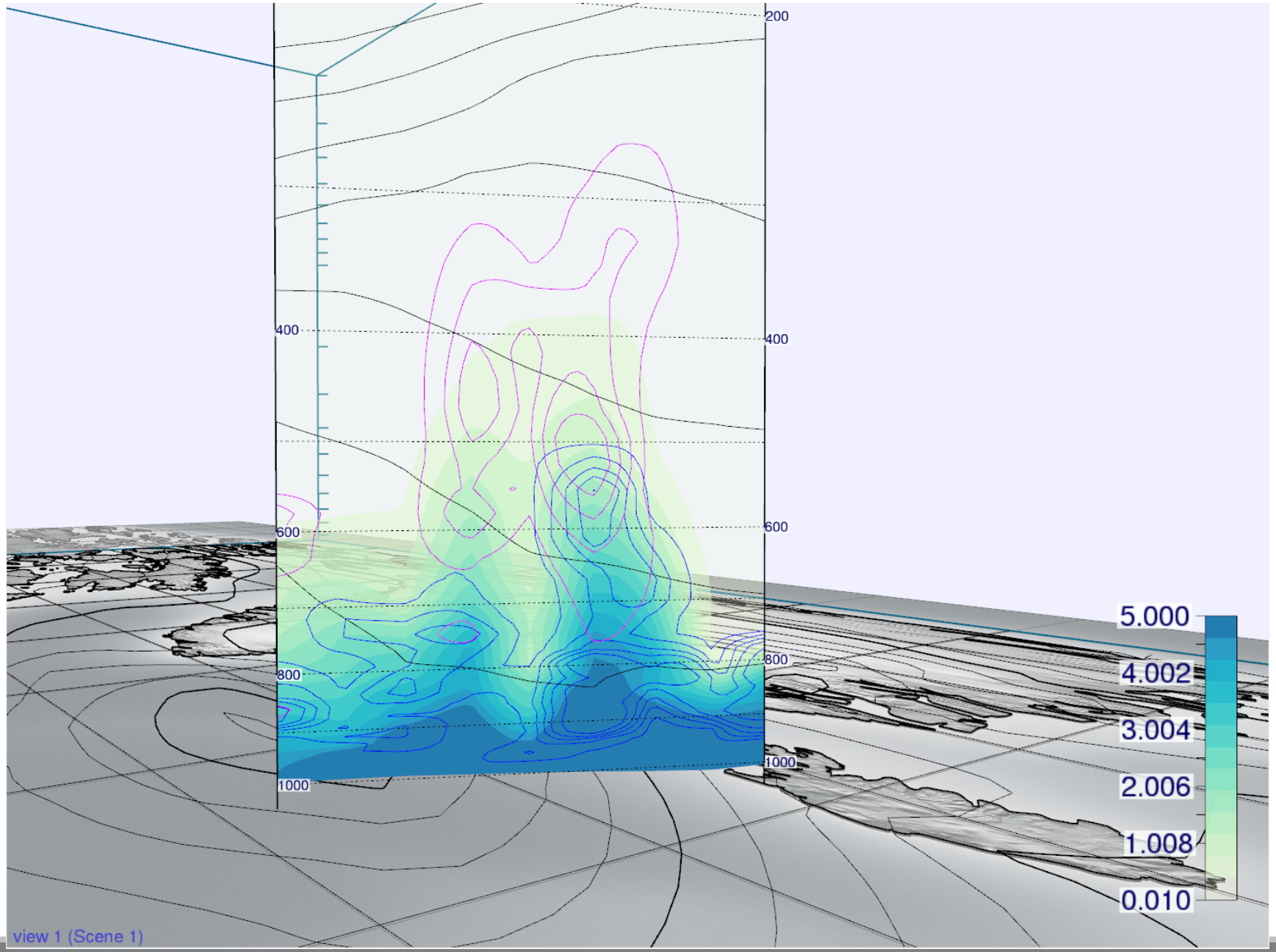
BT05/00Z VT07/15Z

- Meet SAFIRE at 13:40 (1)
- Coordinated leg (1-2)
- Sat overpass at 14:27 & WCB ascent (3-5)
- Trough (6)
- Meet FALCON at 17:15 (8)
- Coordinated leg (8-10)

Friday 7 October HALO flight



5->1: Coordinated leg with SAFIRE



FALCON

Friday 07 Oct. flight

DLR-FALCON Friday Flight

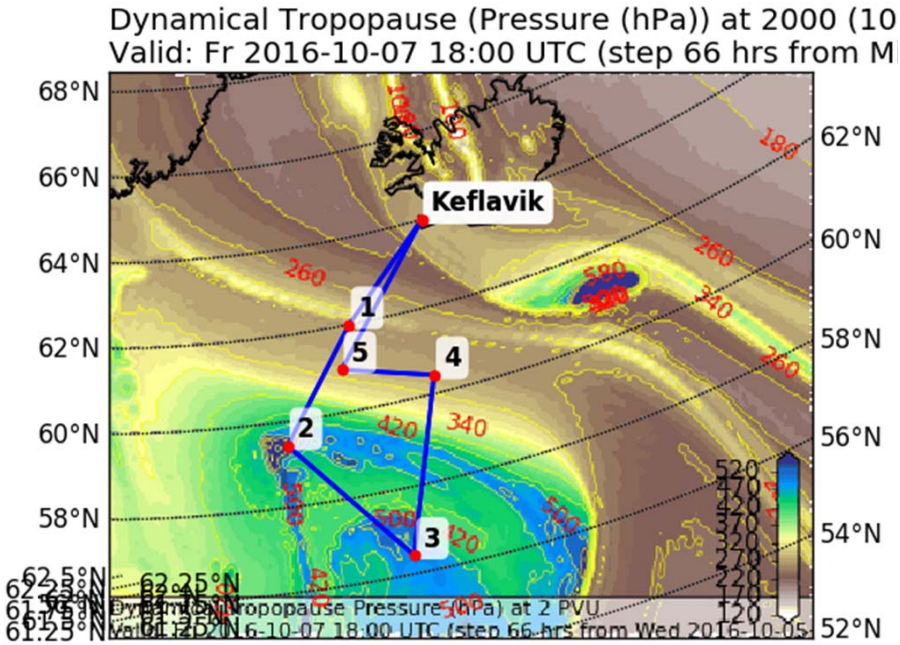
- Coordinated legs with HALO
- “PV-meter” in combination with HALO & dropsondes
- Circuit to estimate divergence

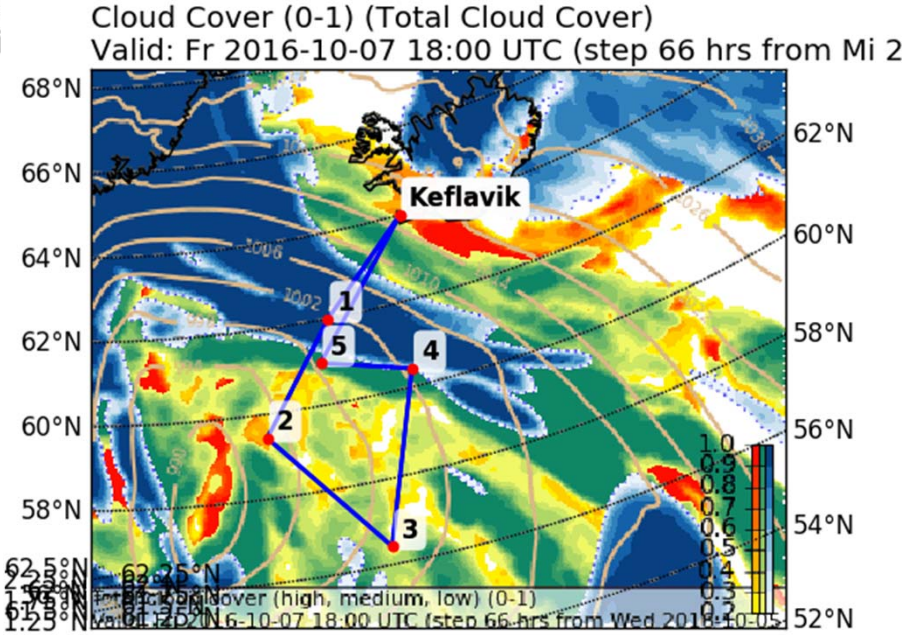
Timing: Centered around meeting point with HALO, 1800Z, waypoint 3.

Take off ~ 1620Z, flighttime ~3h 15min.

Falcon flight Friday, 07 Oct

BT 05/00Z, VT 07/18Z

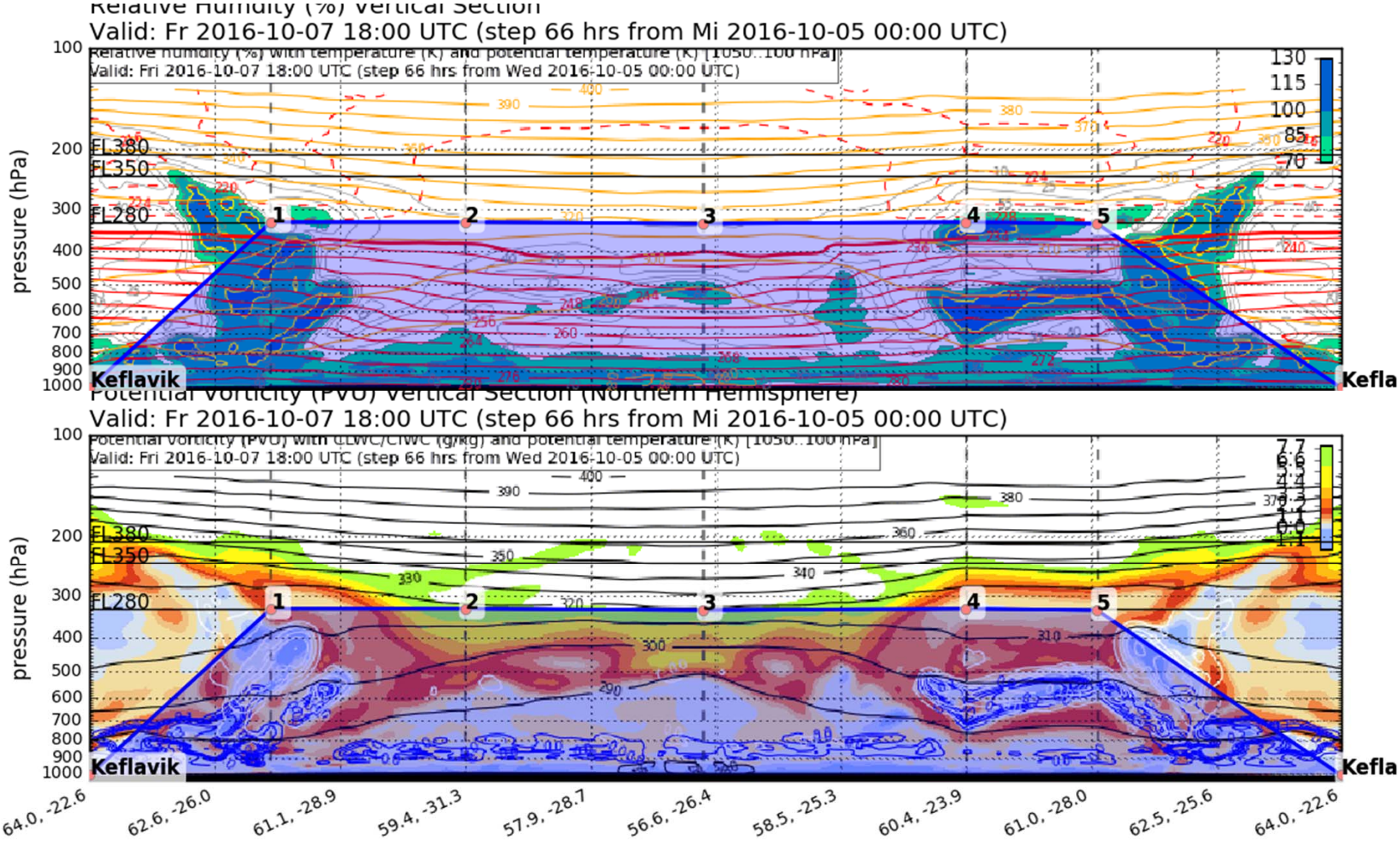




- Legs 3-5 coordinated with HALO
  - PV-meter legs
- Leg 4-5 must be ok for LIDAR, ie., might be adjusted (southward) due to clouds
- Flight level constraints due to NAT TRACKS -> TBD how high we can go.
  -> “the higher the better”

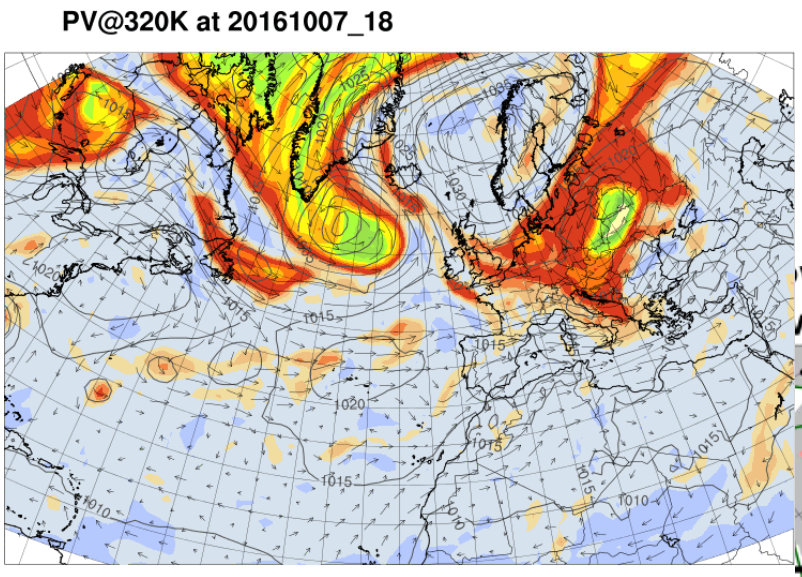
Falcon flight Friday, 07 Oct

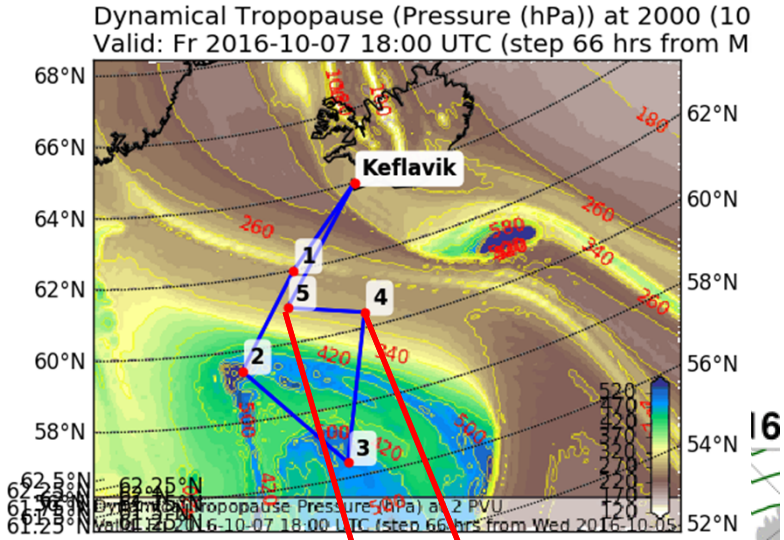
BT 05/00Z, VT 07/18Z

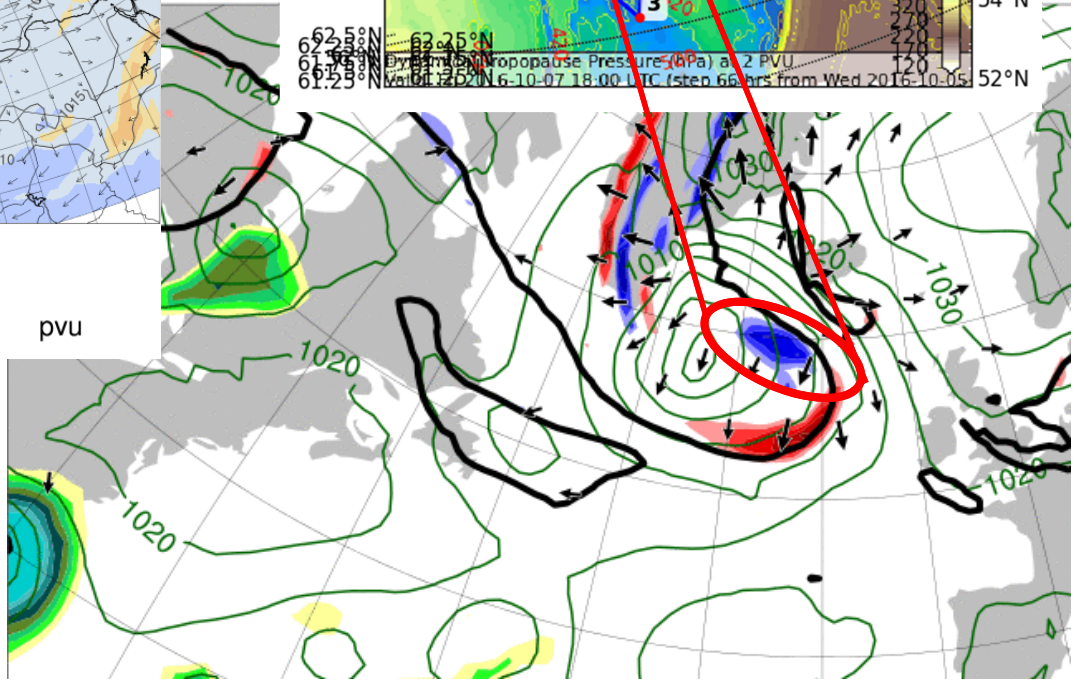


Falcon flight Friday, 07 Oct

BT 05/00Z, VT 07/18Z







RADIOSONDES

Update