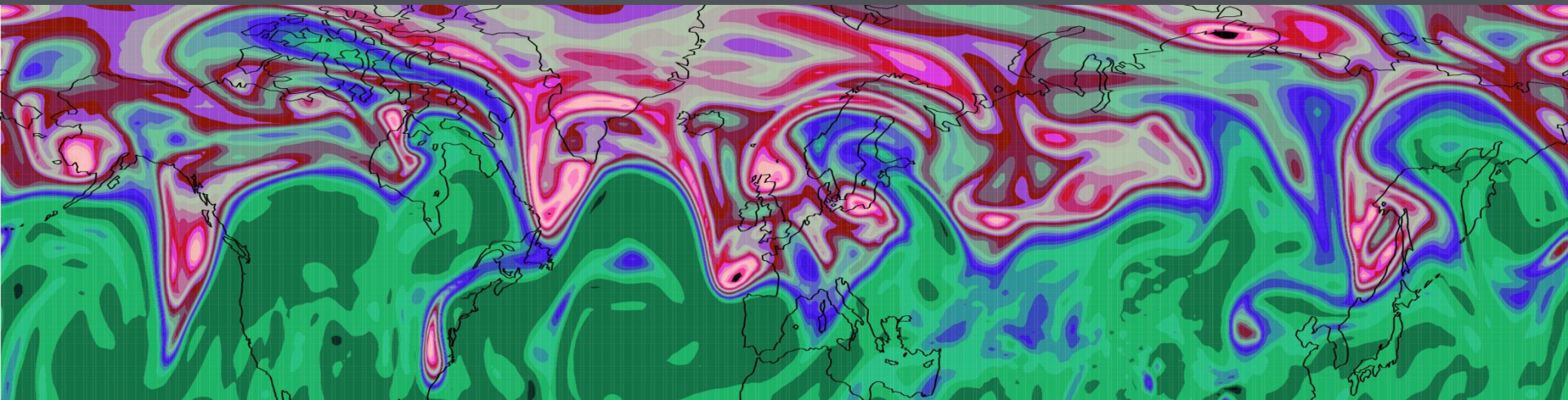


NORTH ATLANTIC WAVEGUIDE AND DOWNSTREAM IMPACTS EXPERIMENT



PV evolution this week

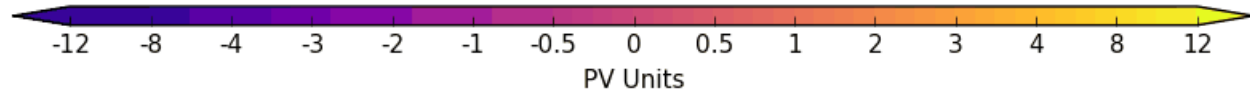
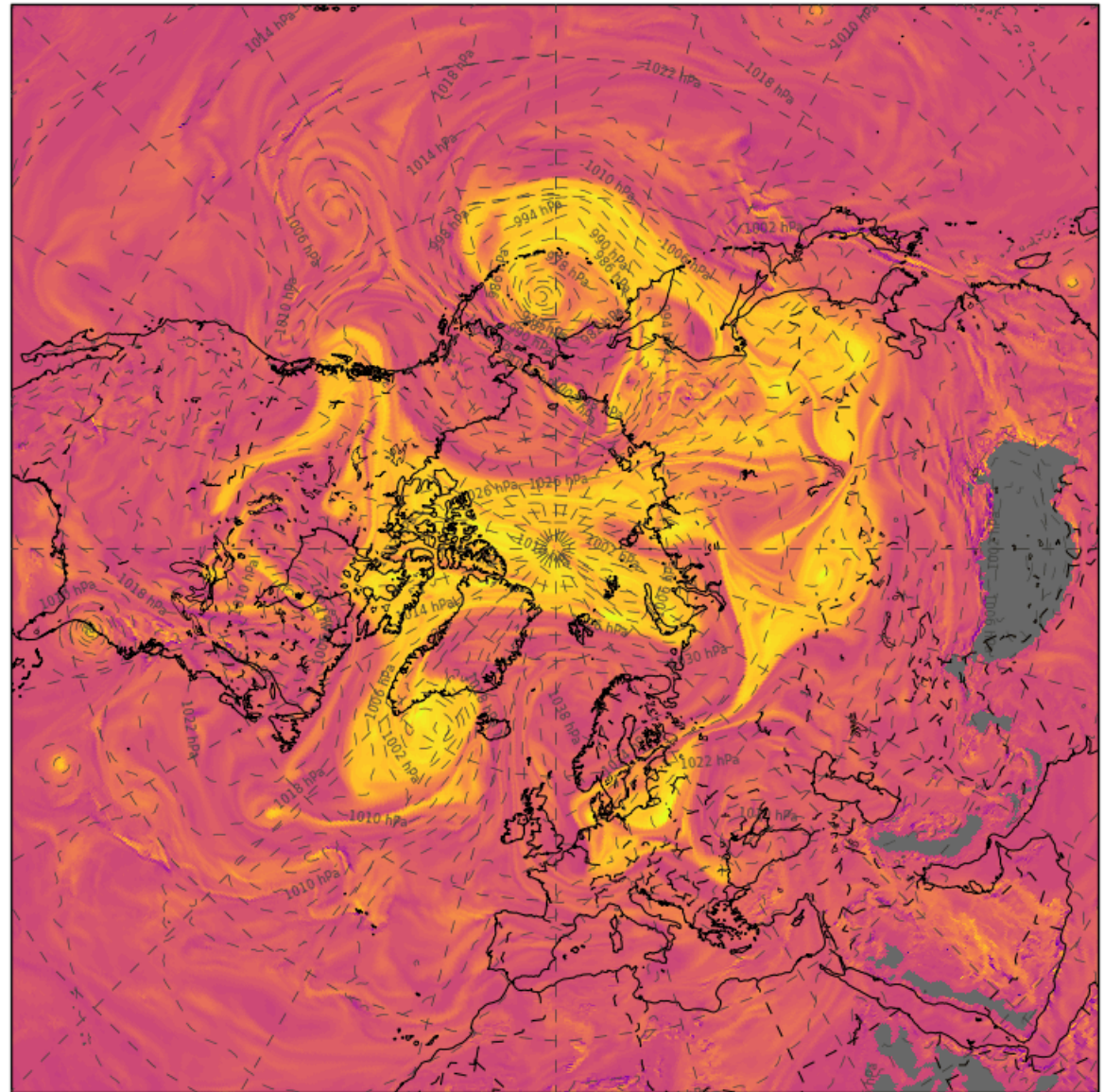
John Methven,
Department of Meteorology,
University of Reading

PV (315K) NH

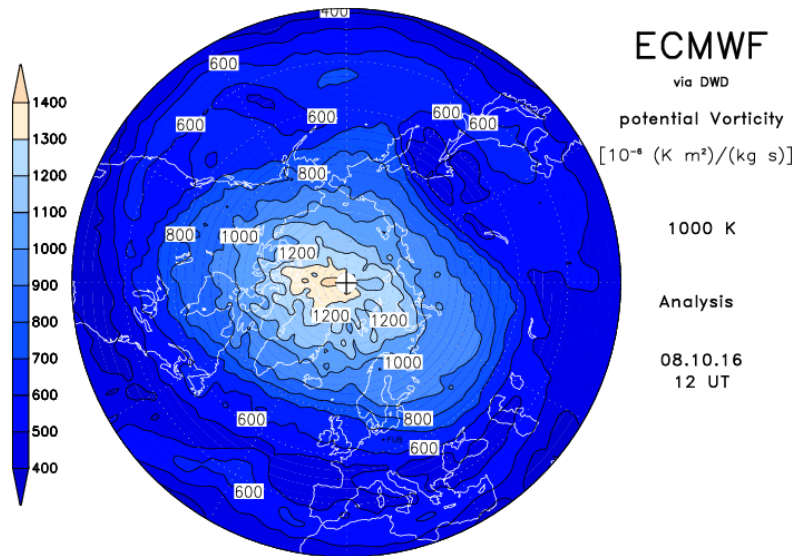
Saturday
12 UT 08/10/16

Note the amazing
symmetry between
Atlantic and Pacific
Trough/ridge with
cyclonic breaking.

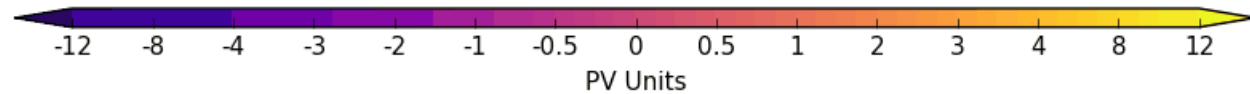
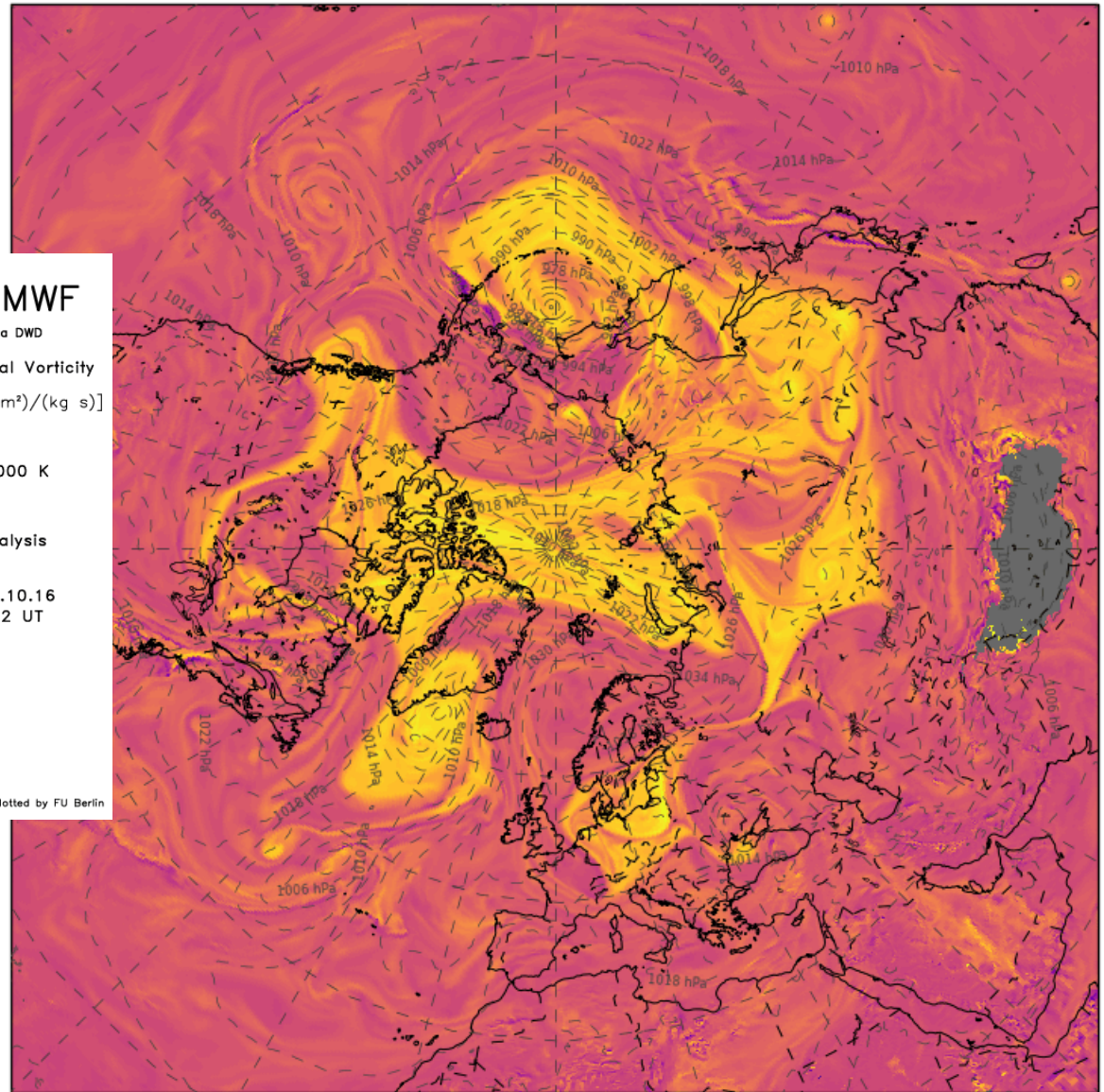
Dominant zonal
wavenumbers 2 and 4



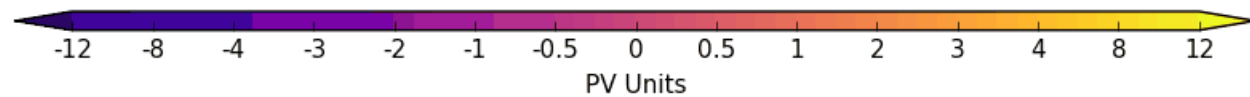
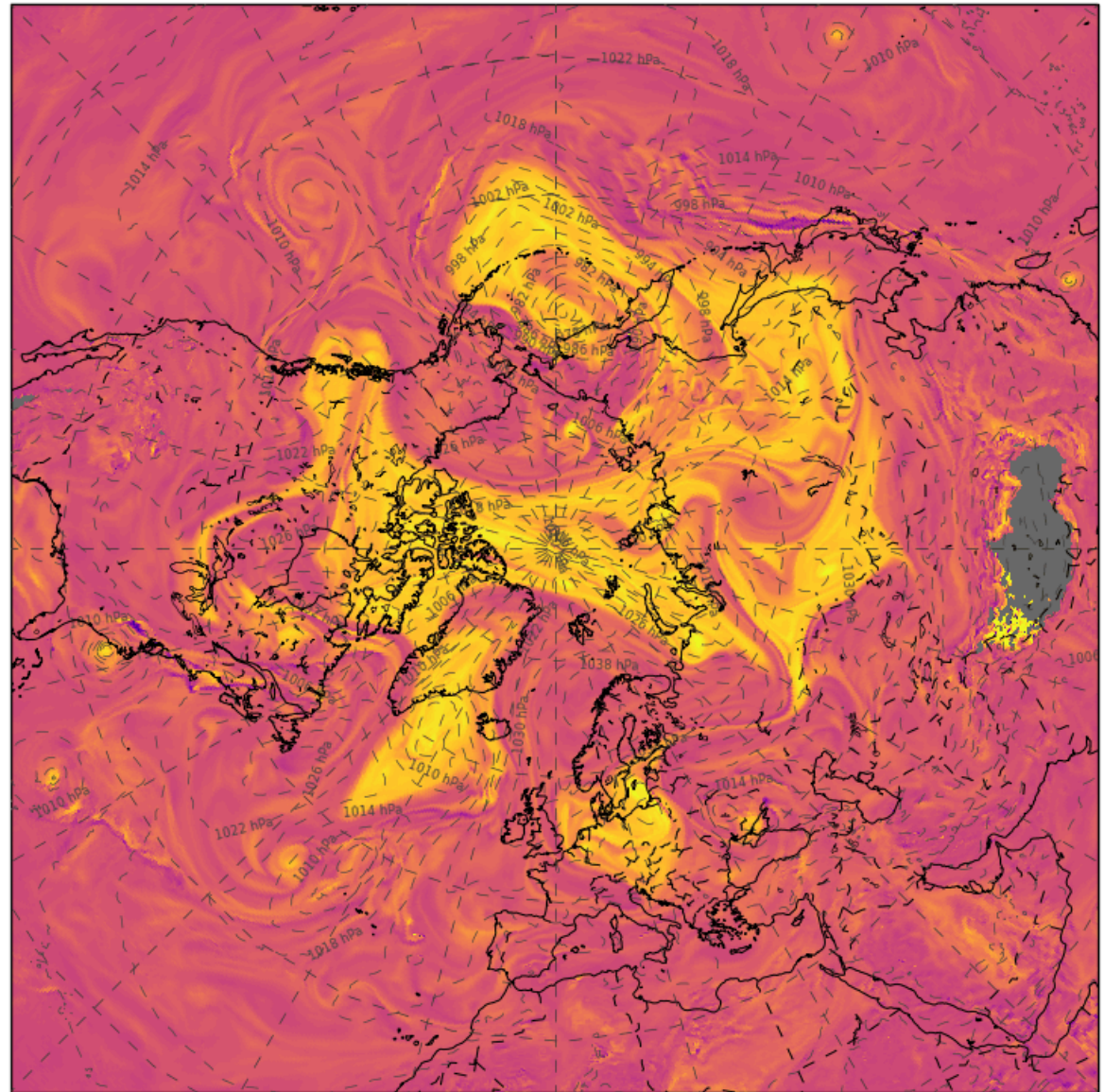
PV (315K) NH



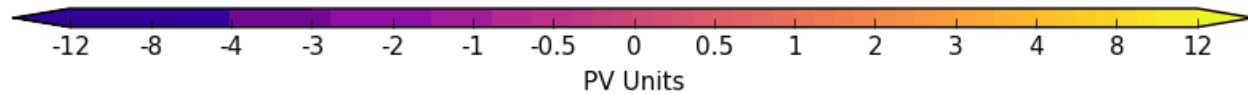
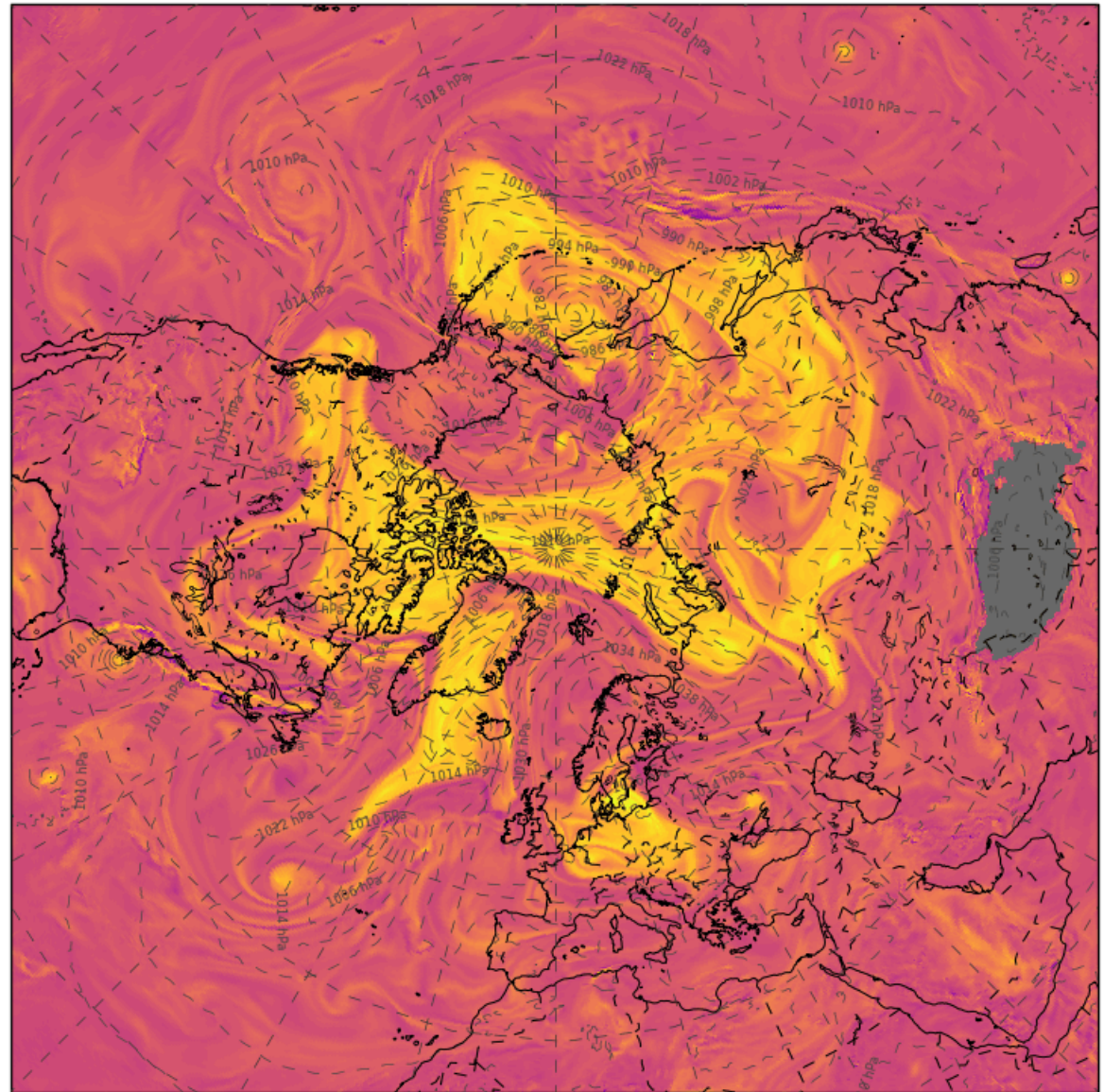
calculated and plotted by FU Berlin



PV (315K) NH



PV (315K) NH

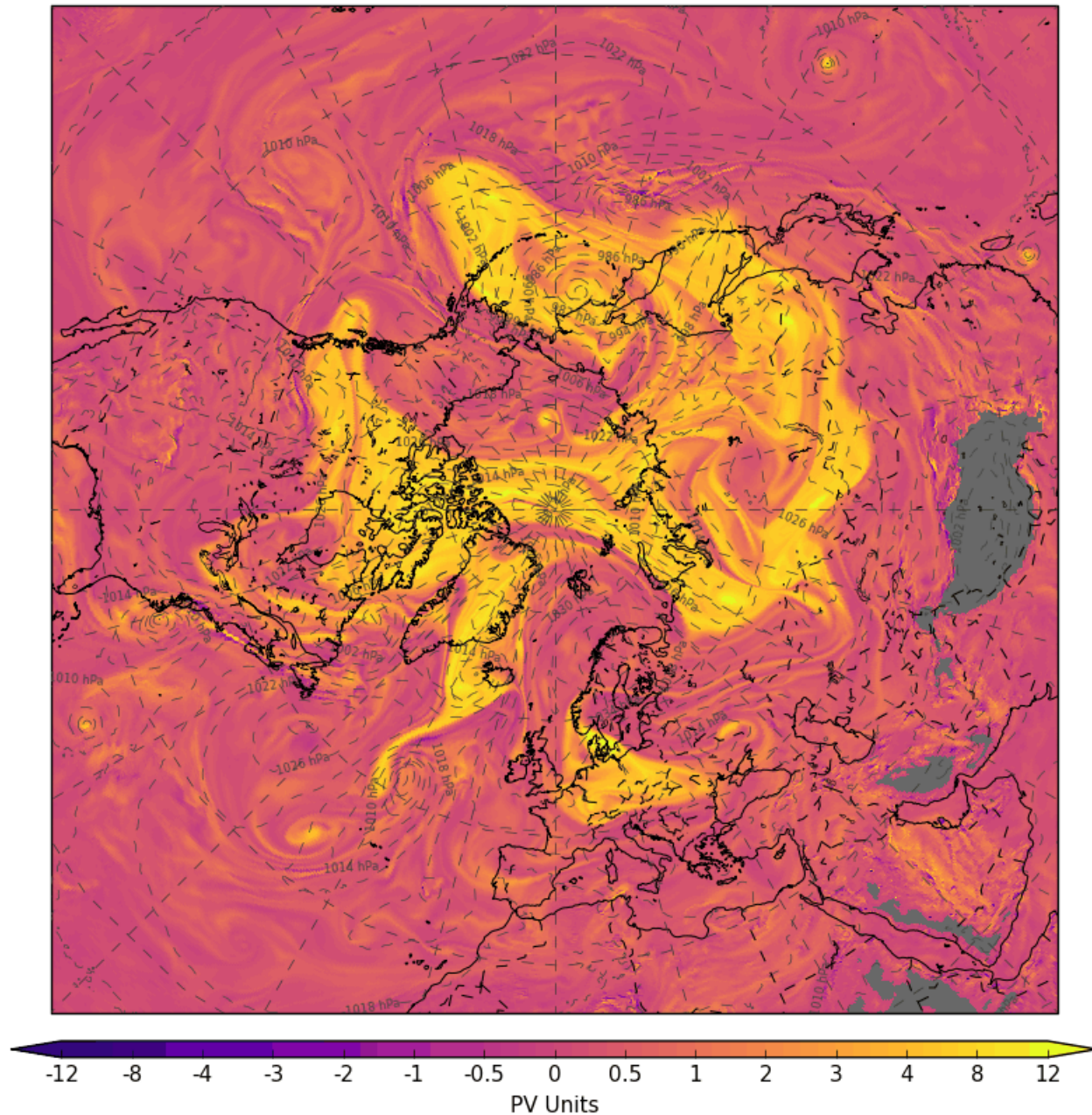


PV (315K) NH

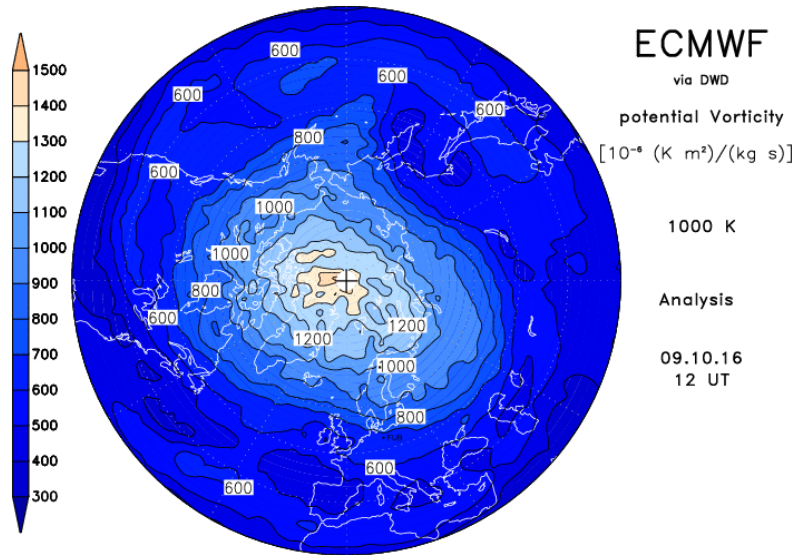
Sunday
12 UT 09/10/16

Symmetry broken by
deformation of trough
over the Atlantic.

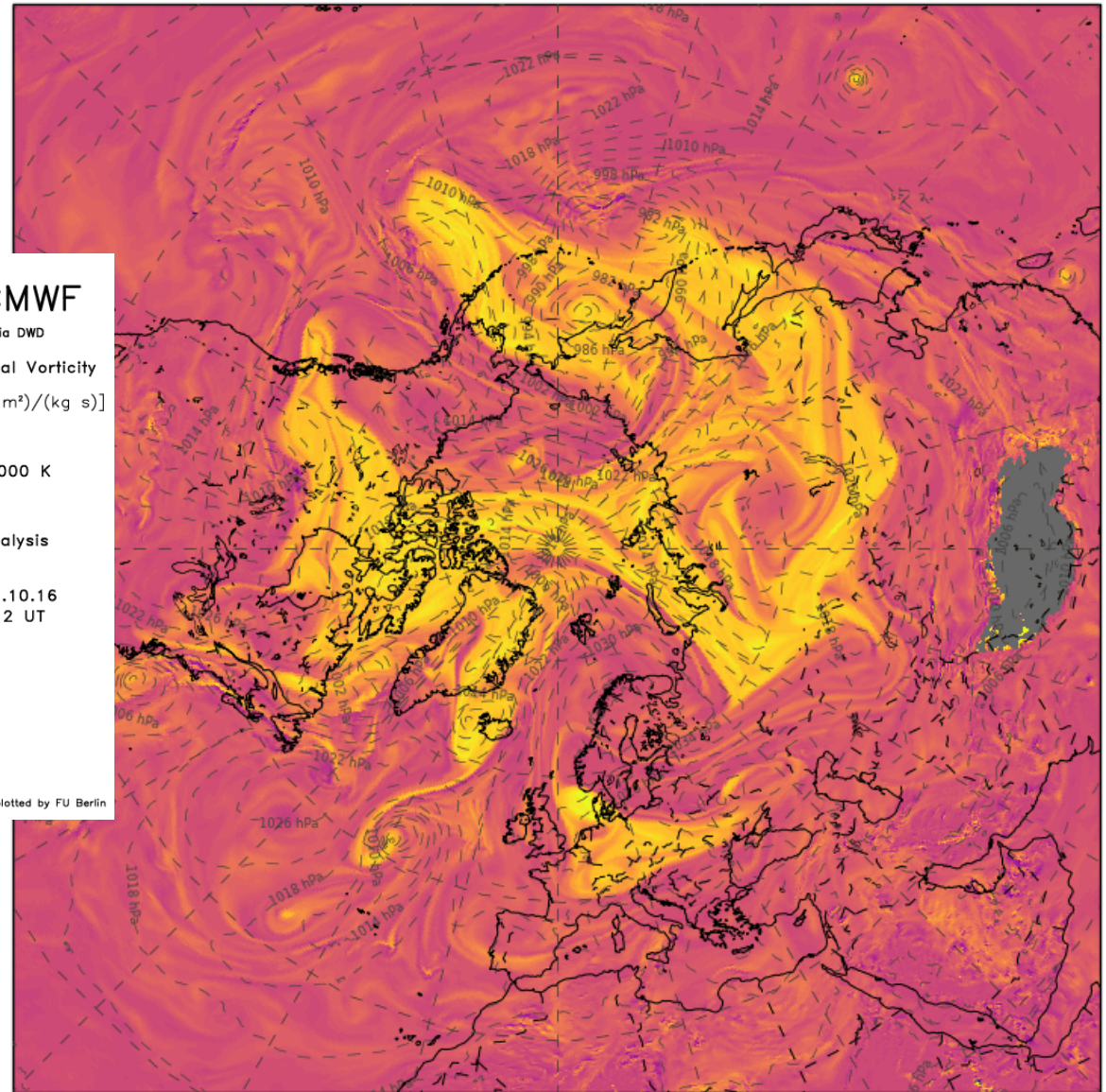
PV streamer rolling up
into 3 vortices



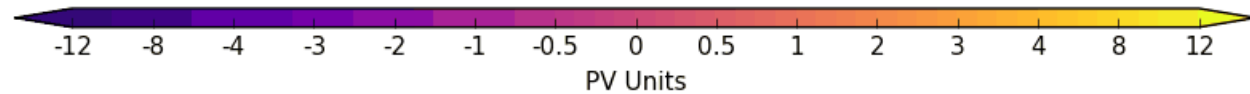
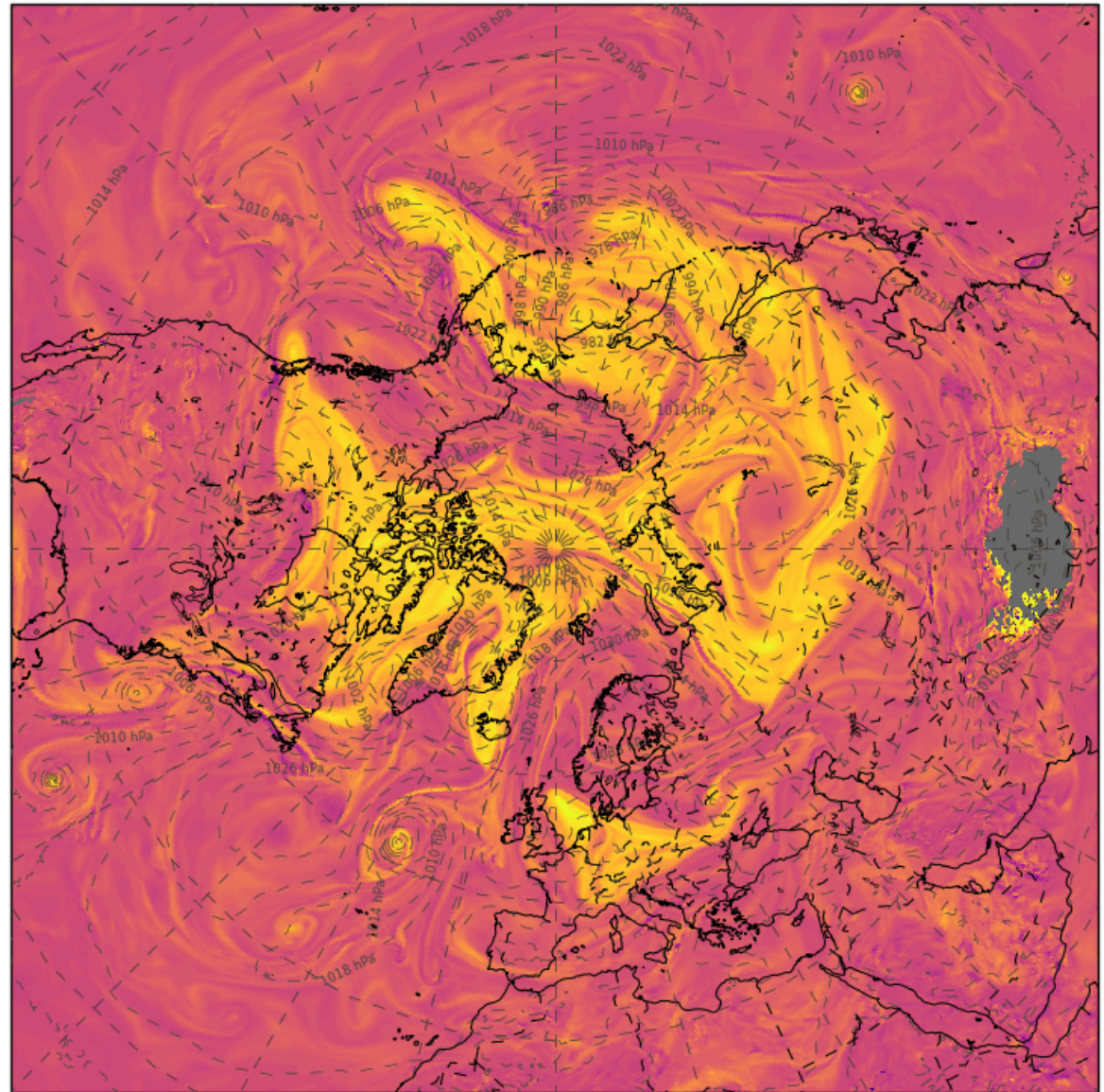
PV (315K) NH



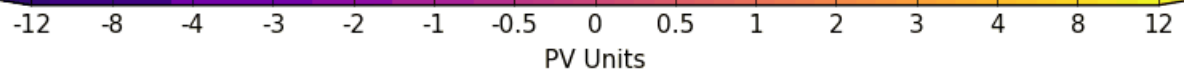
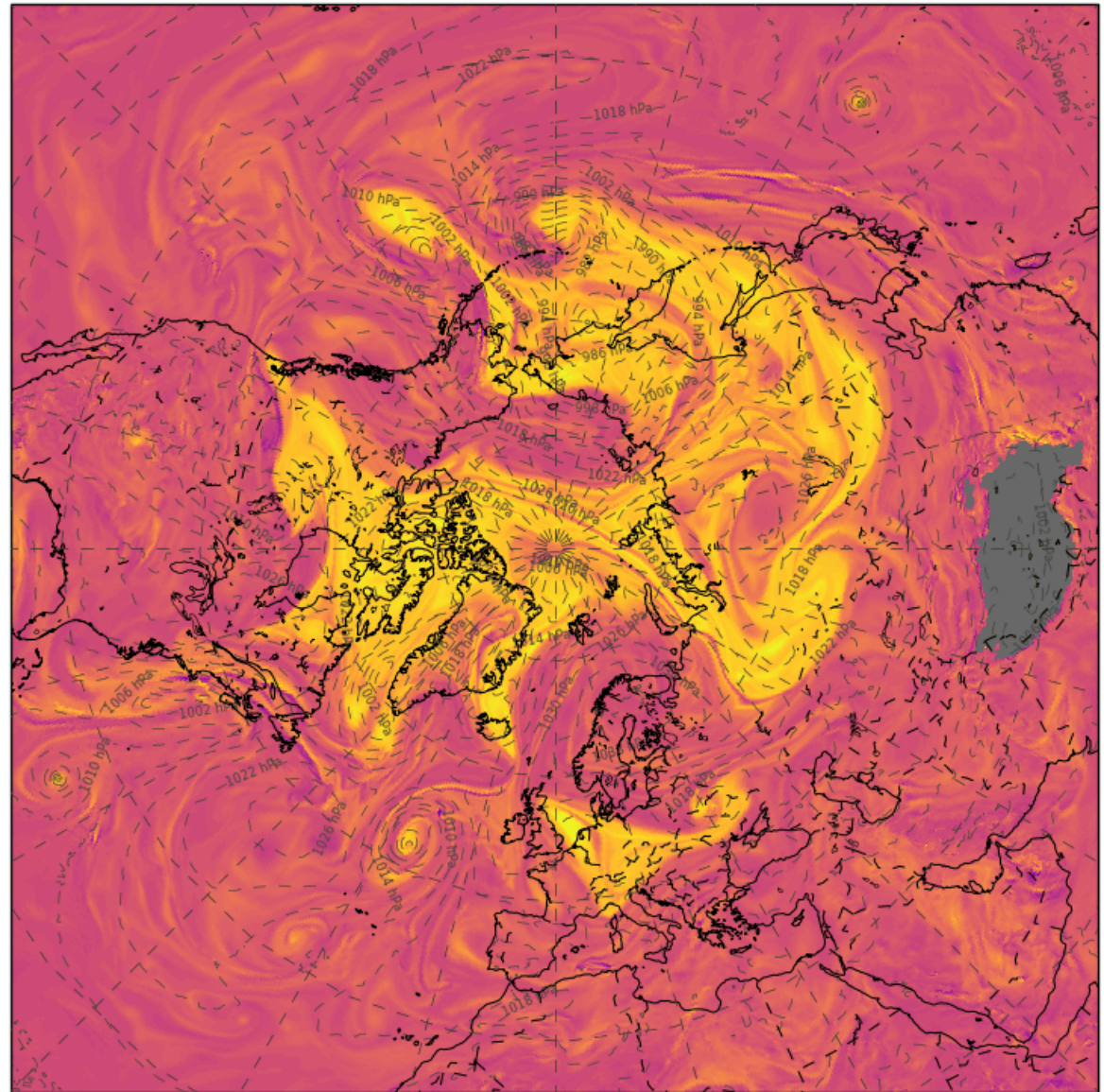
calculated and plotted by FU Berlin



PV (315K) NH



PV (315K) NH

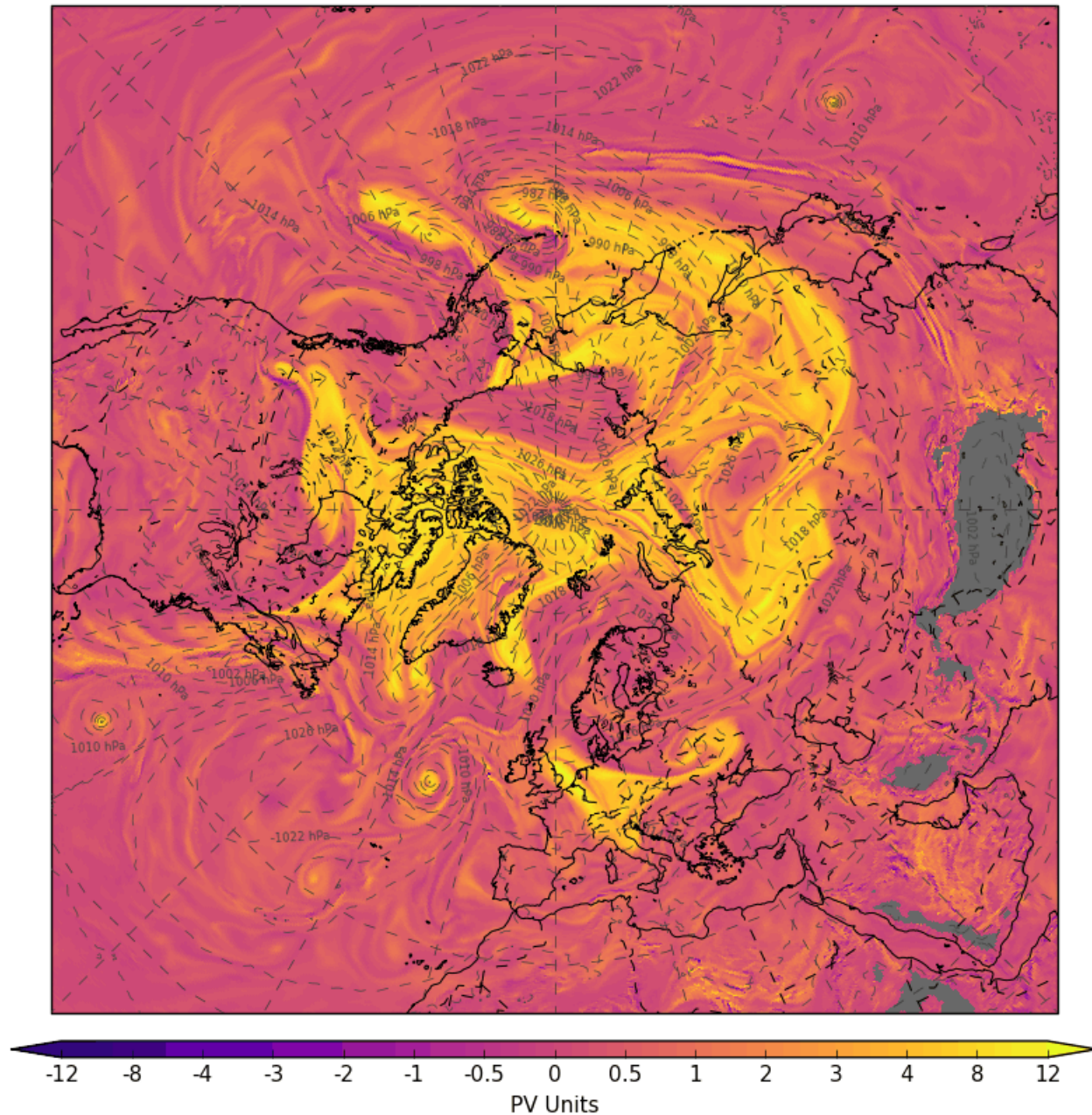


PV (315K) NH

Monday
12 UT 10/10/16

Cut-off cyclone forming
from streamer:
Sanchez/Brigitte

By now wavenumber 4 is
lost, but wavenumber 2
remains

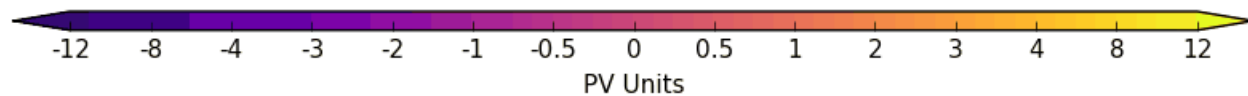
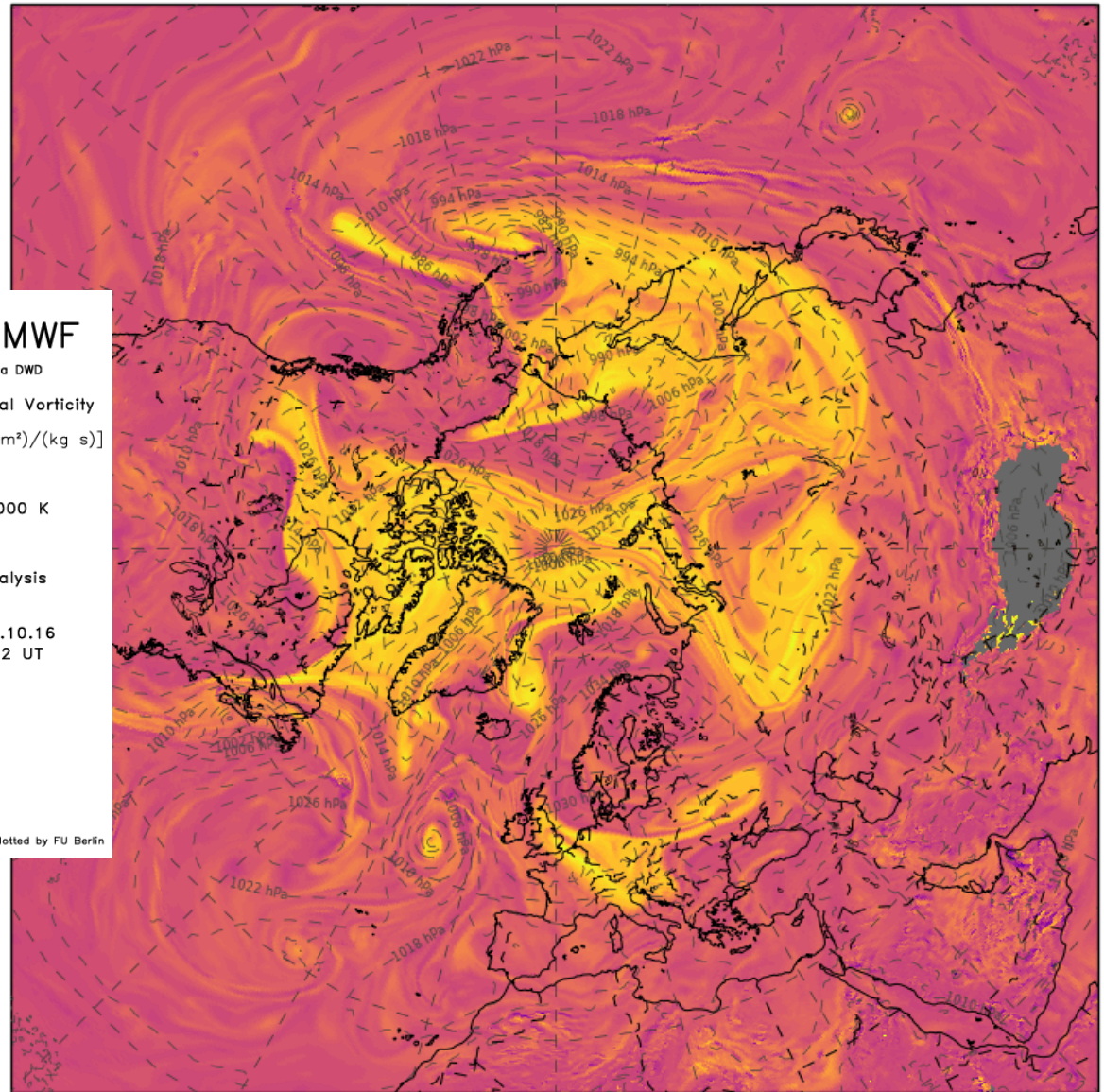
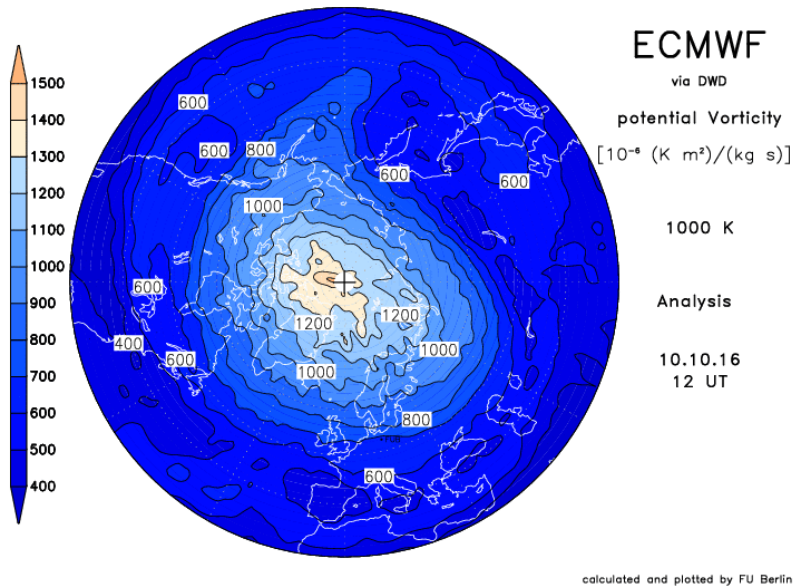


PV (315K) NH

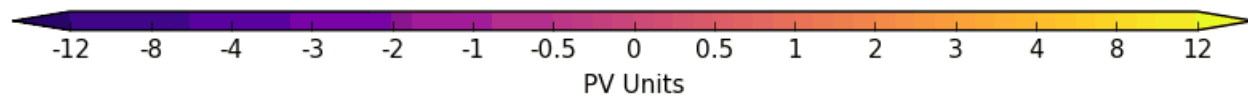
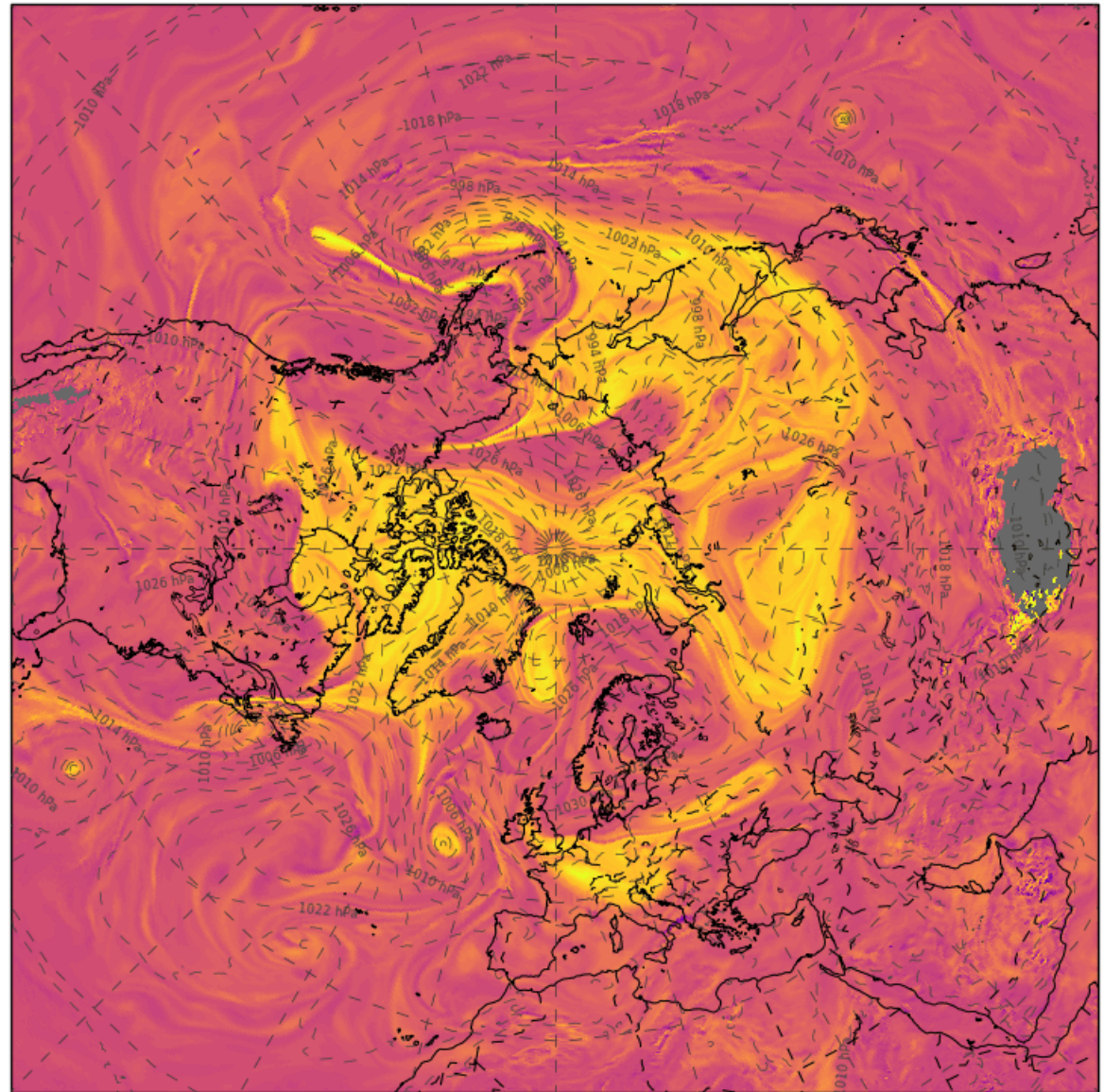
Monday

18 UT 11/10/16

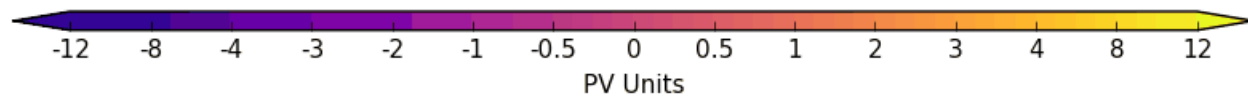
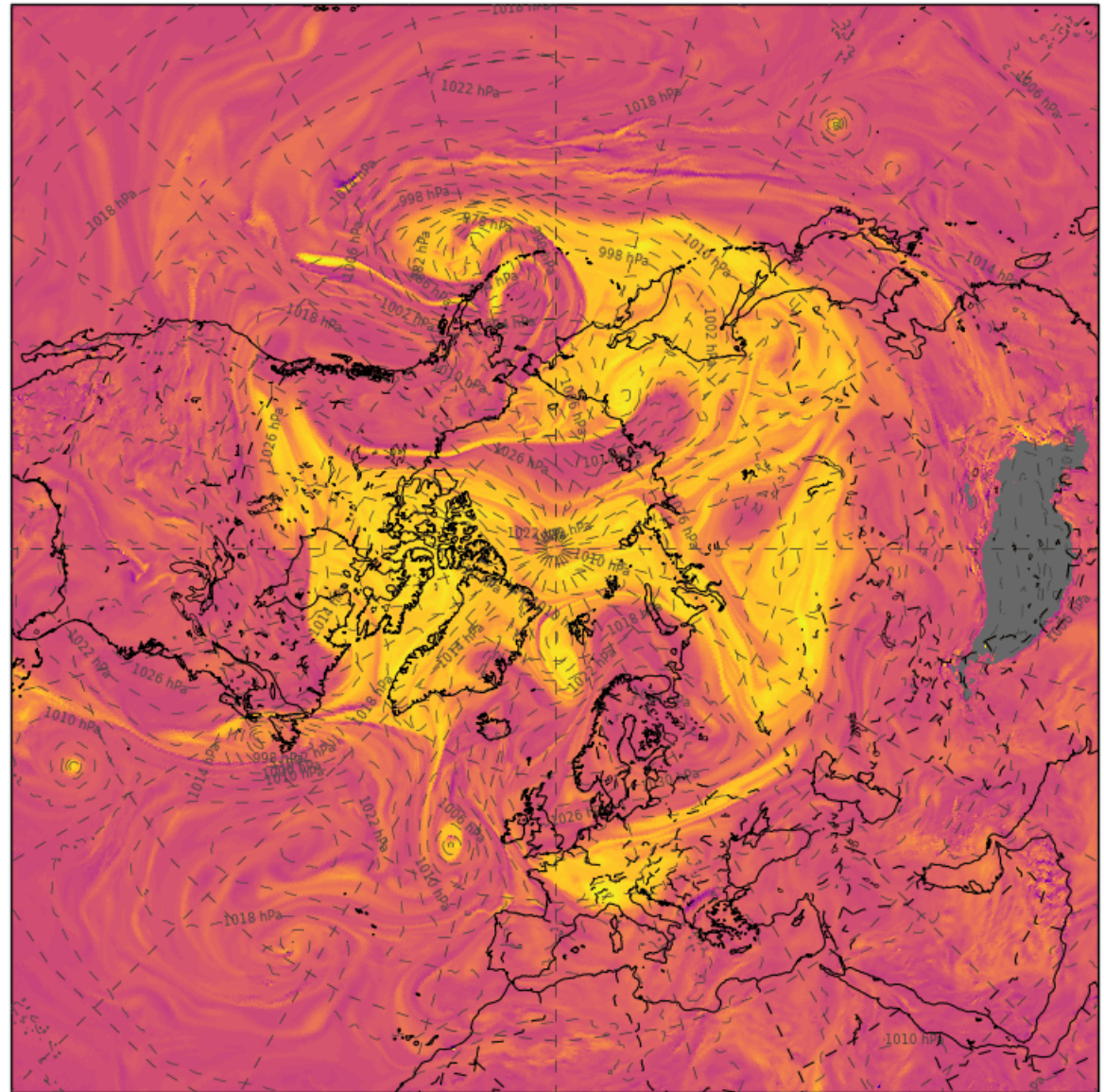
Coupling of ex-Matthew with trough



PV (315K) NH



PV (315K) NH

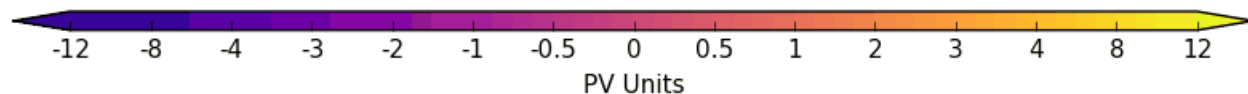
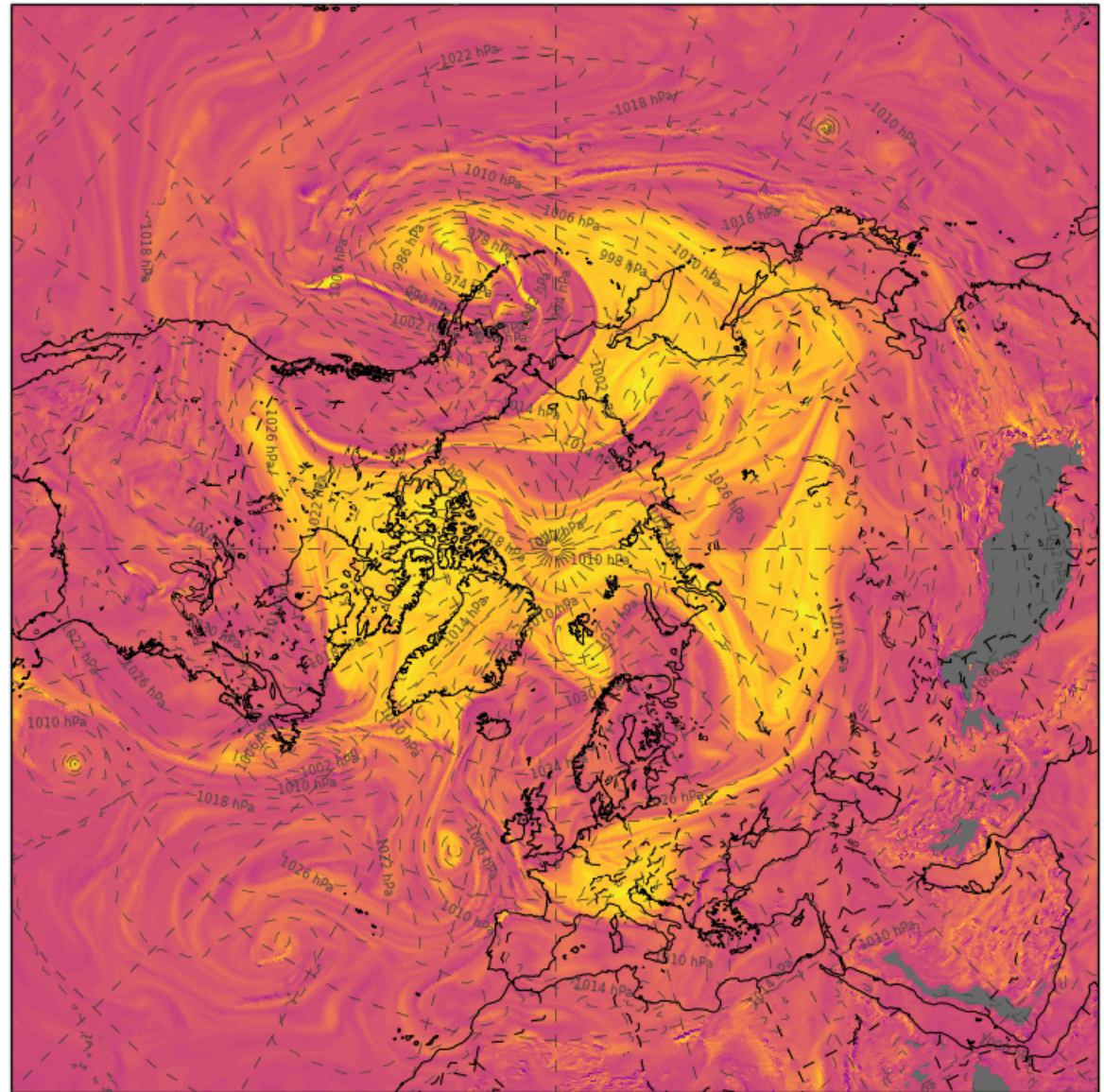


PV Units

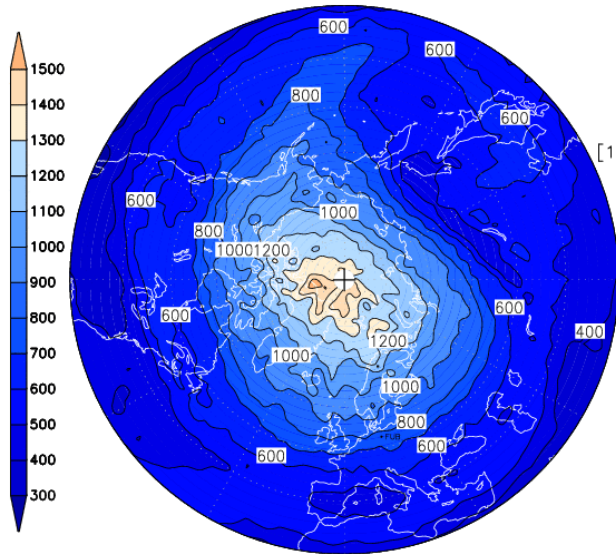
PV (315K) NH

Tuesday
12 UT 11/10/16

Ridge ahead of PV stream
extending far polewards



PV (315K) NH



ECMWF
via DWD
potential Vorticity
[$10^{-6} (\text{K m}^2)/(\text{kg s})$]

1000 K

24 h forecast

10.10.16

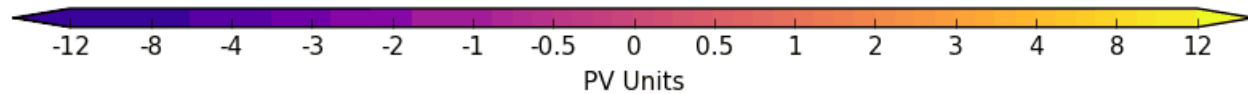
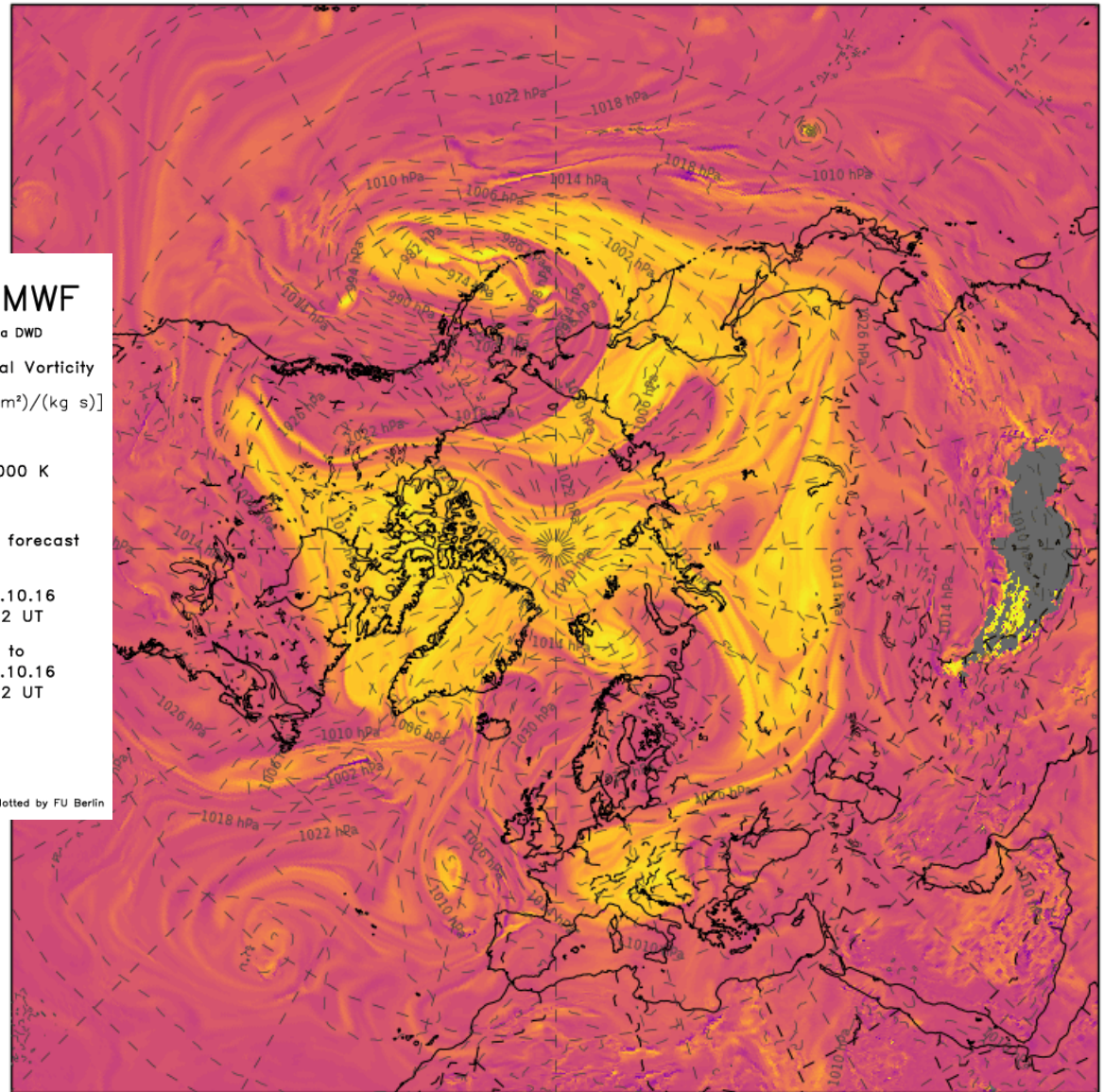
12 UT

to

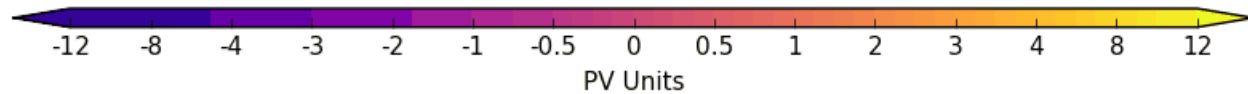
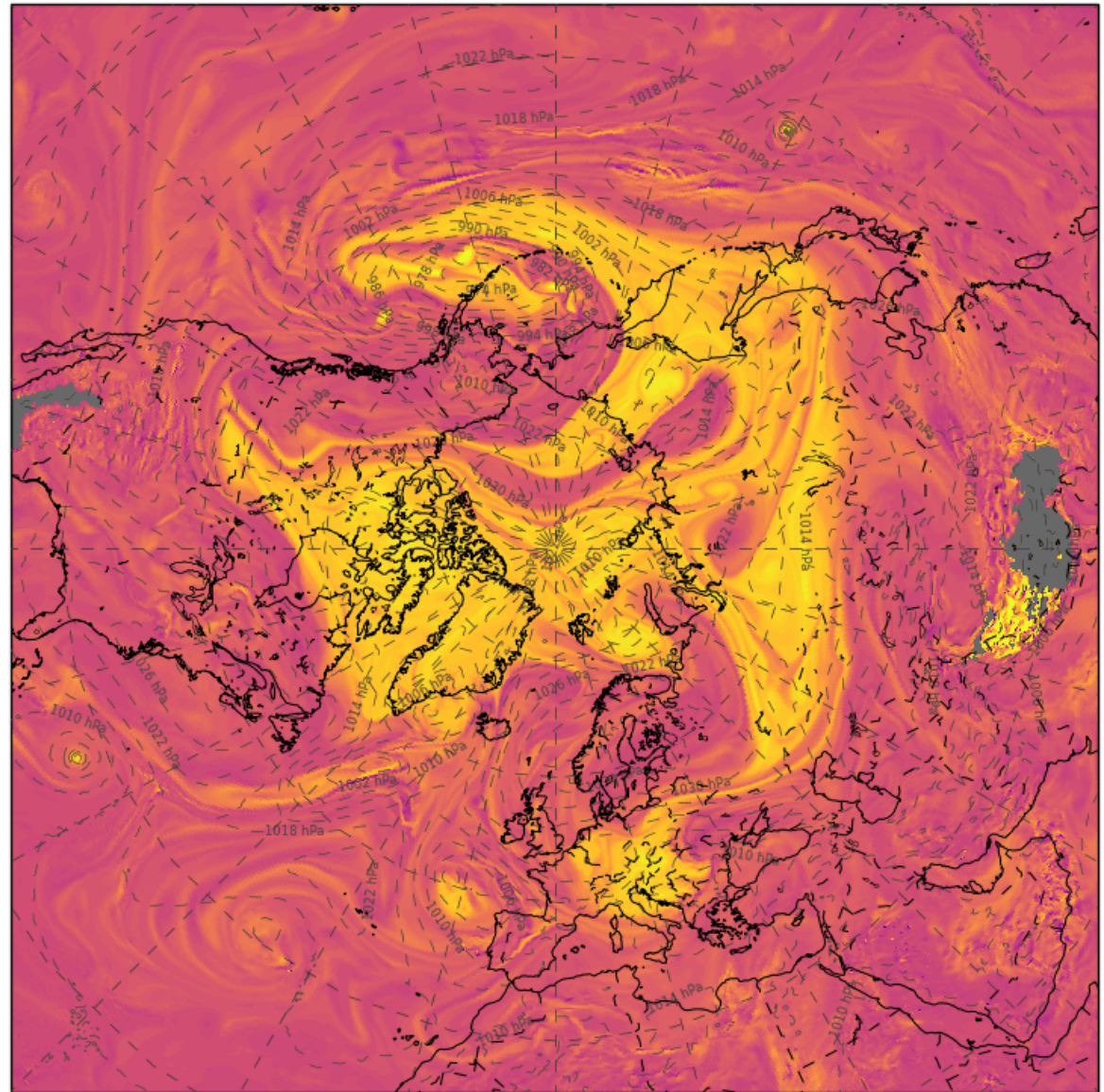
11.10.16

12 UT

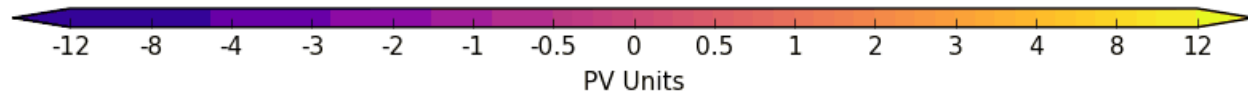
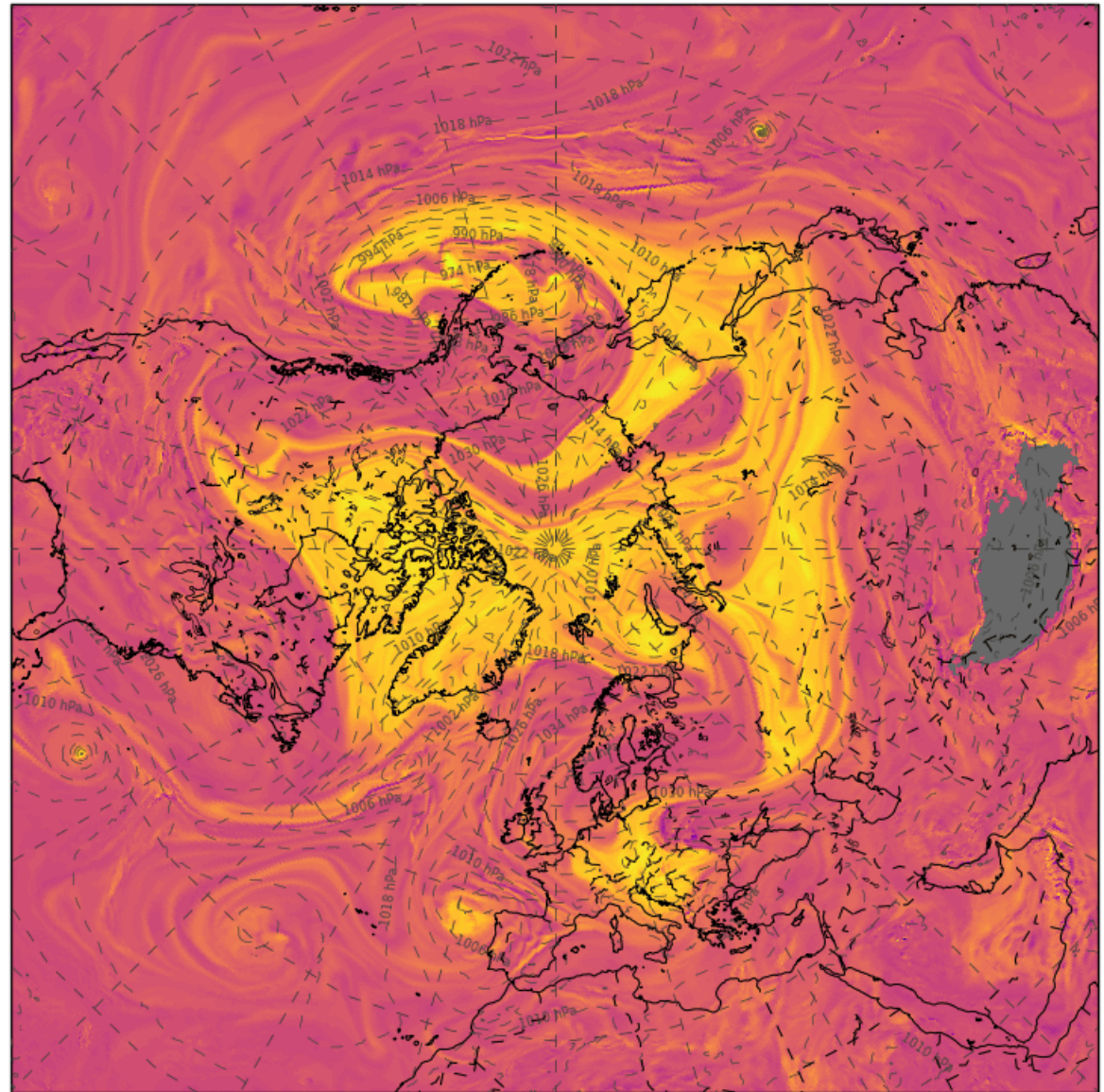
calculated and plotted by FU Berlin



PV (315K) NH



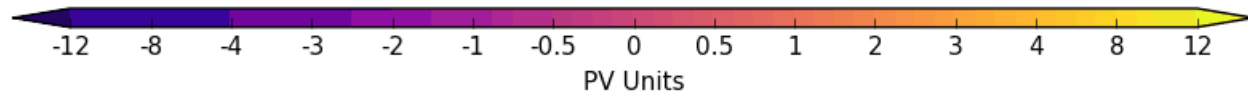
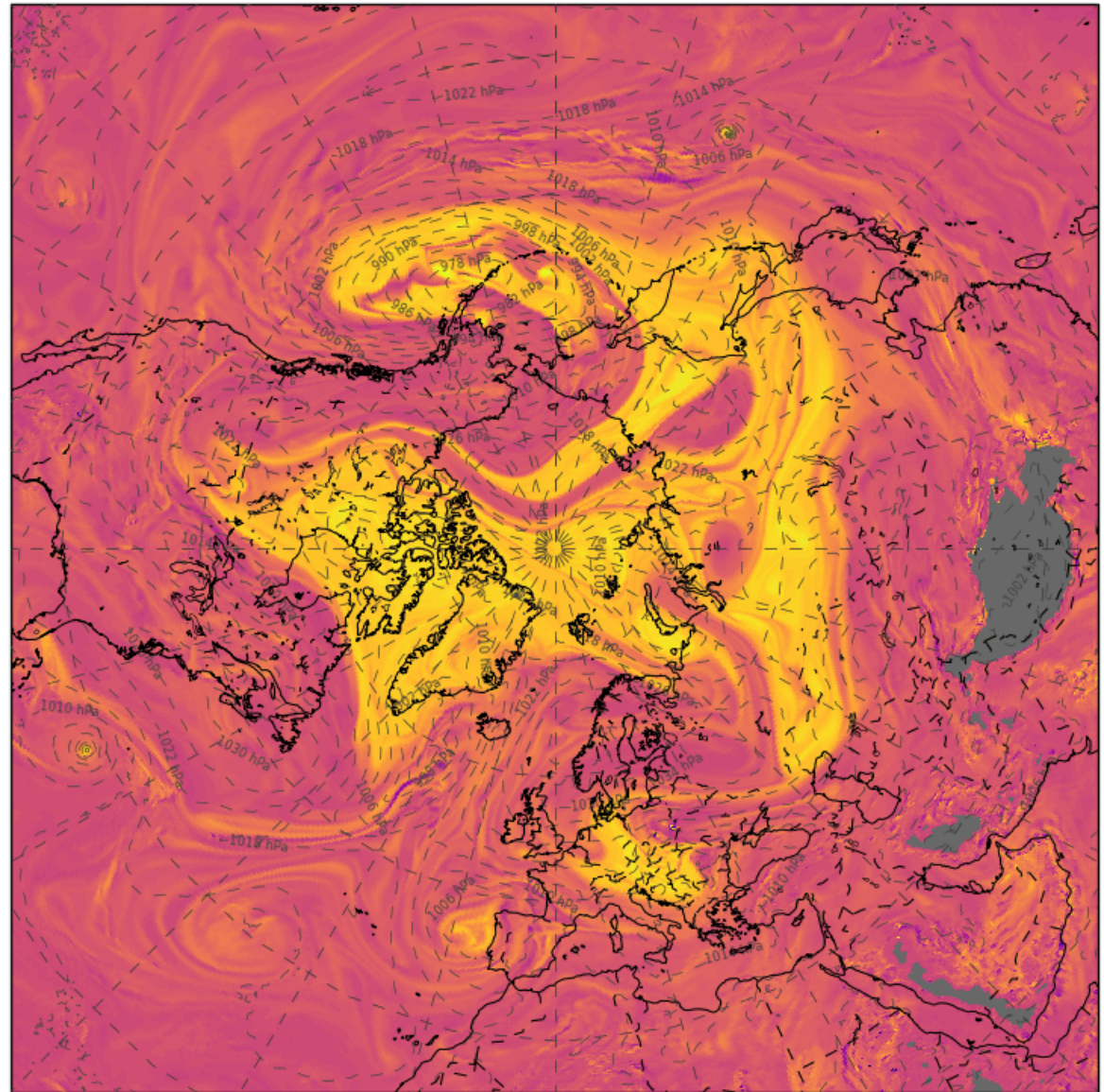
PV (315K) NH



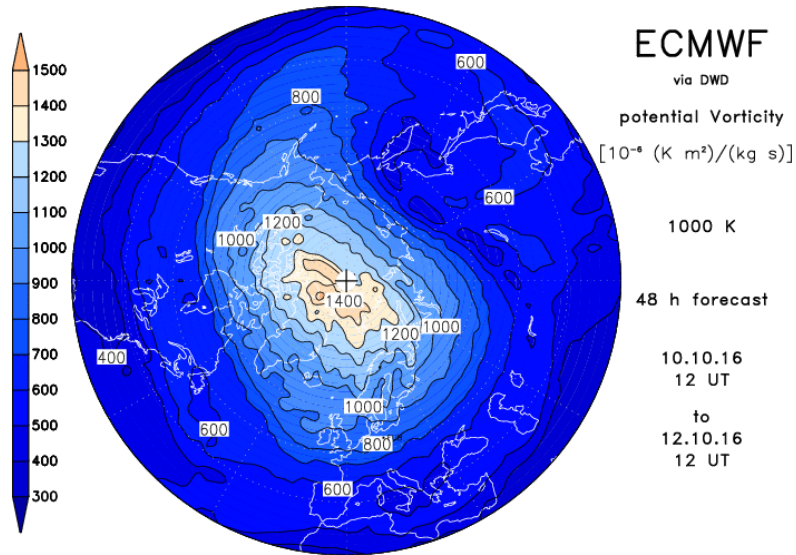
PV (315K) NH

Wednesday
12 UT 12/10/16

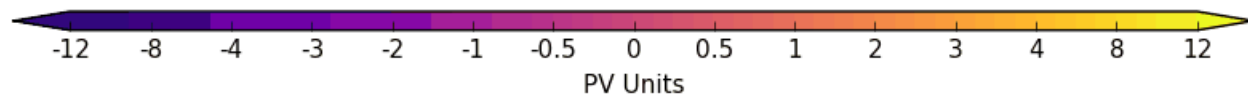
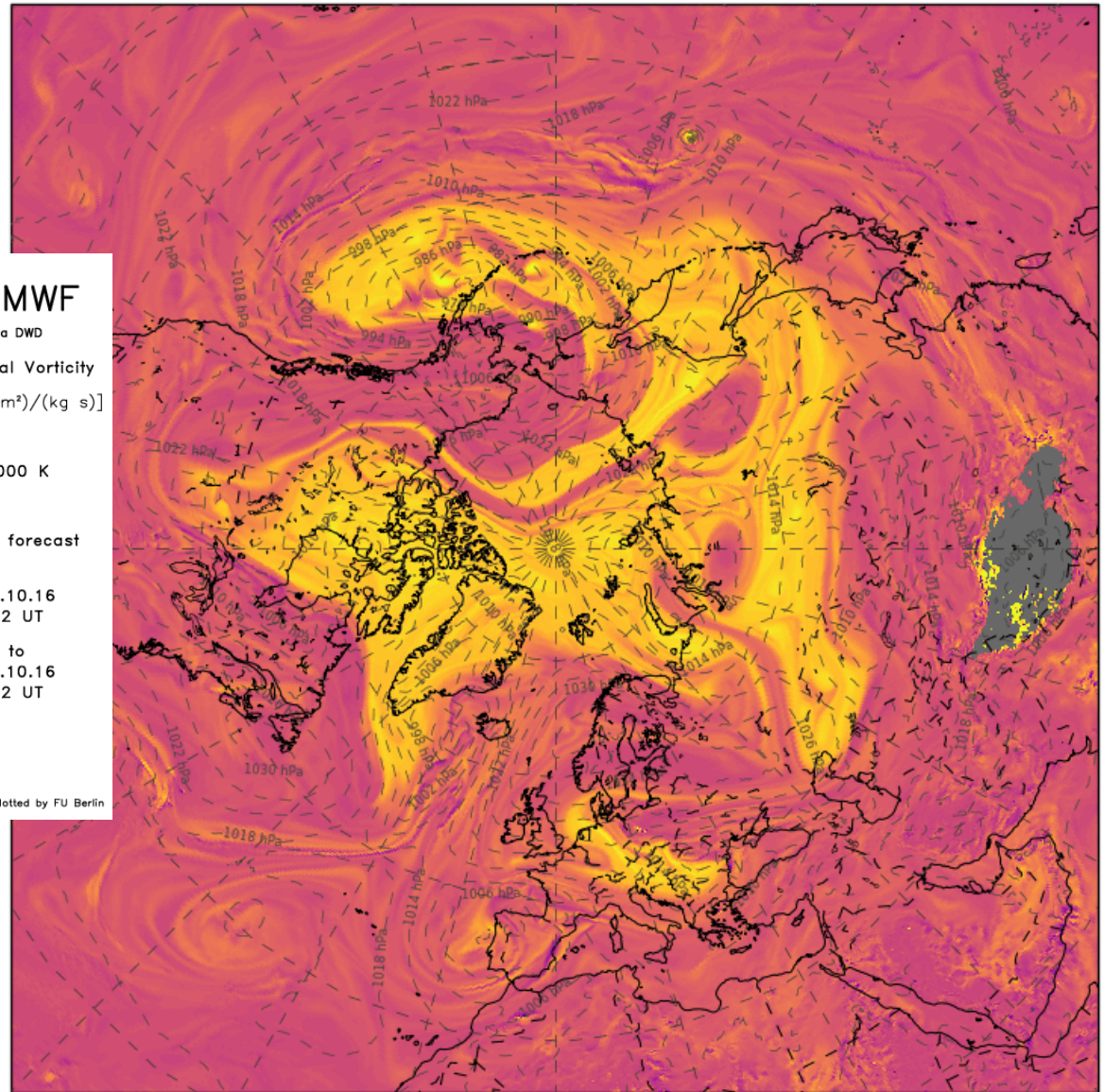
Poleward extension ahead
of Matthew remnants



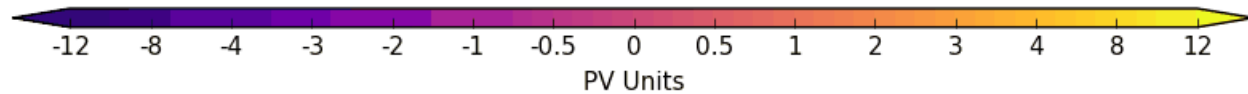
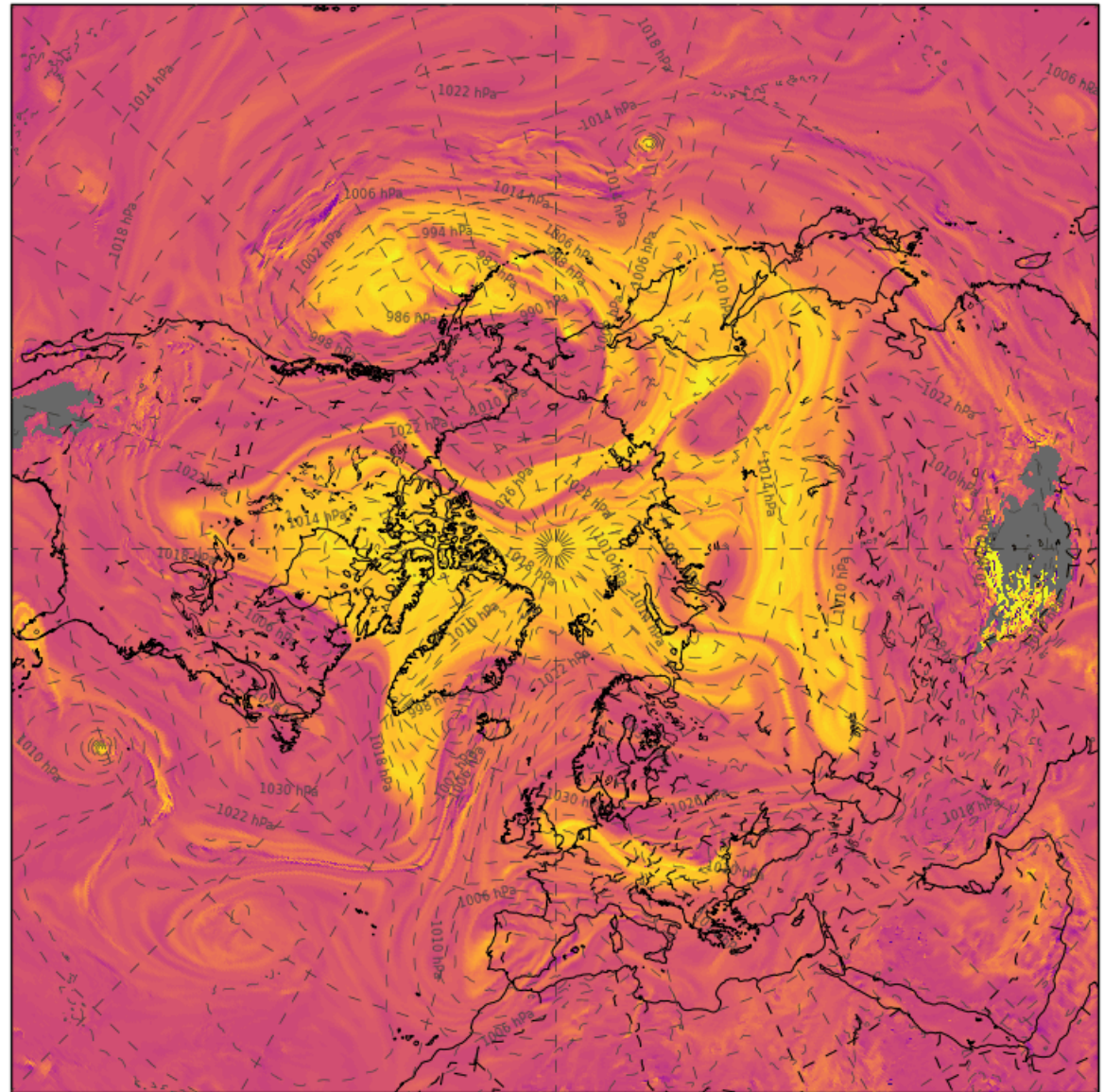
PV (315K) NH



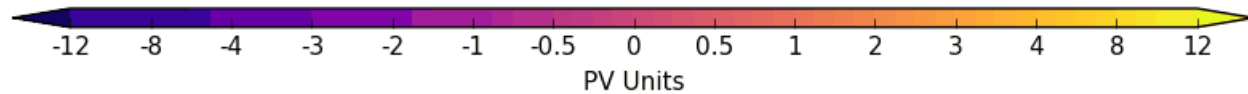
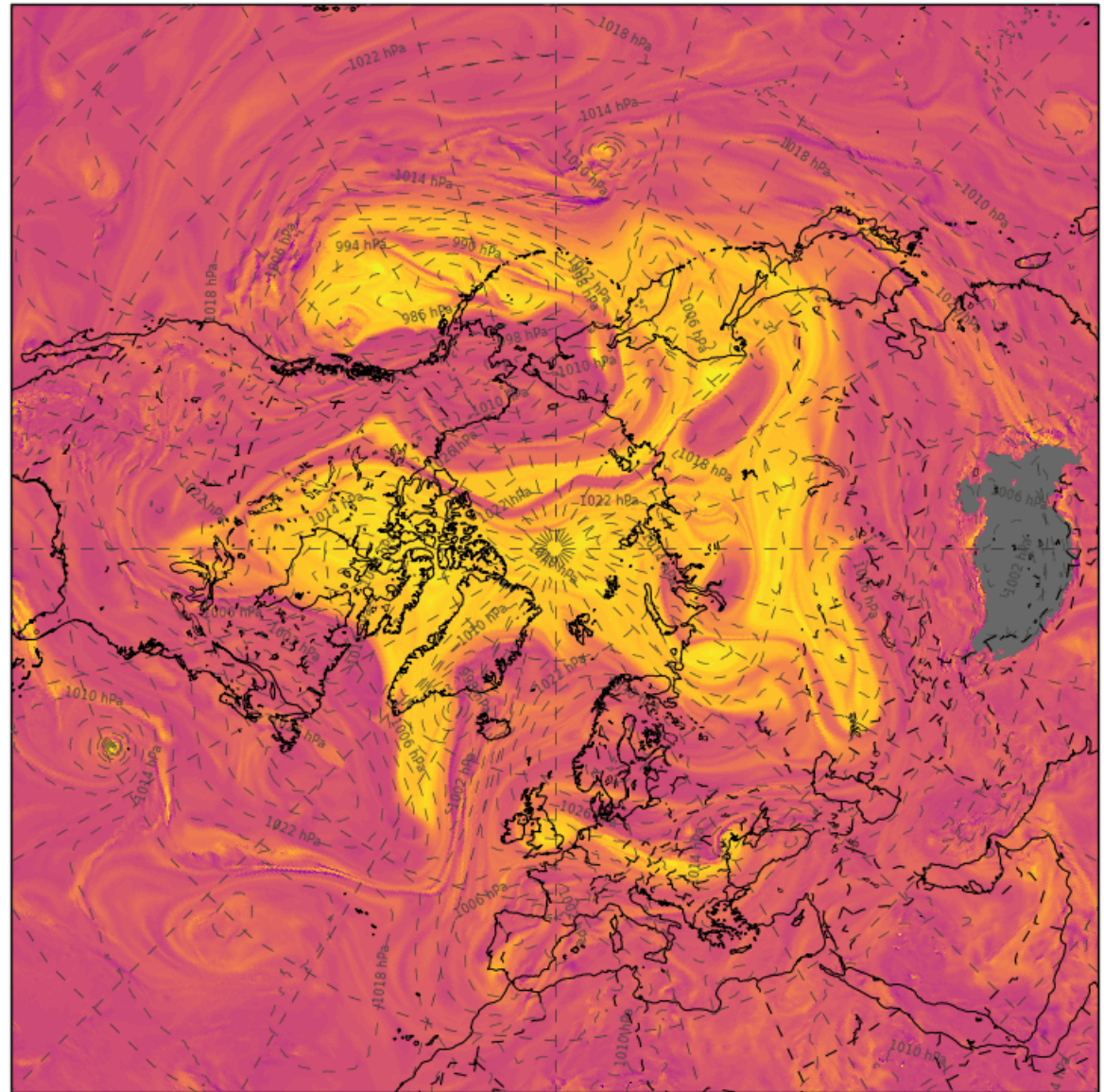
calculated and plotted by FU Berlin



PV (315K) NH



PV (315K) NH



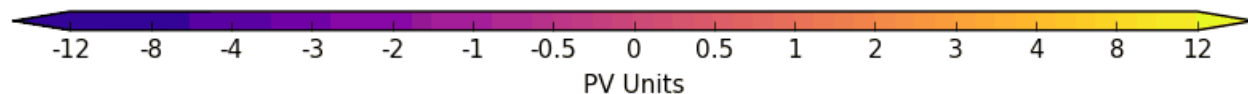
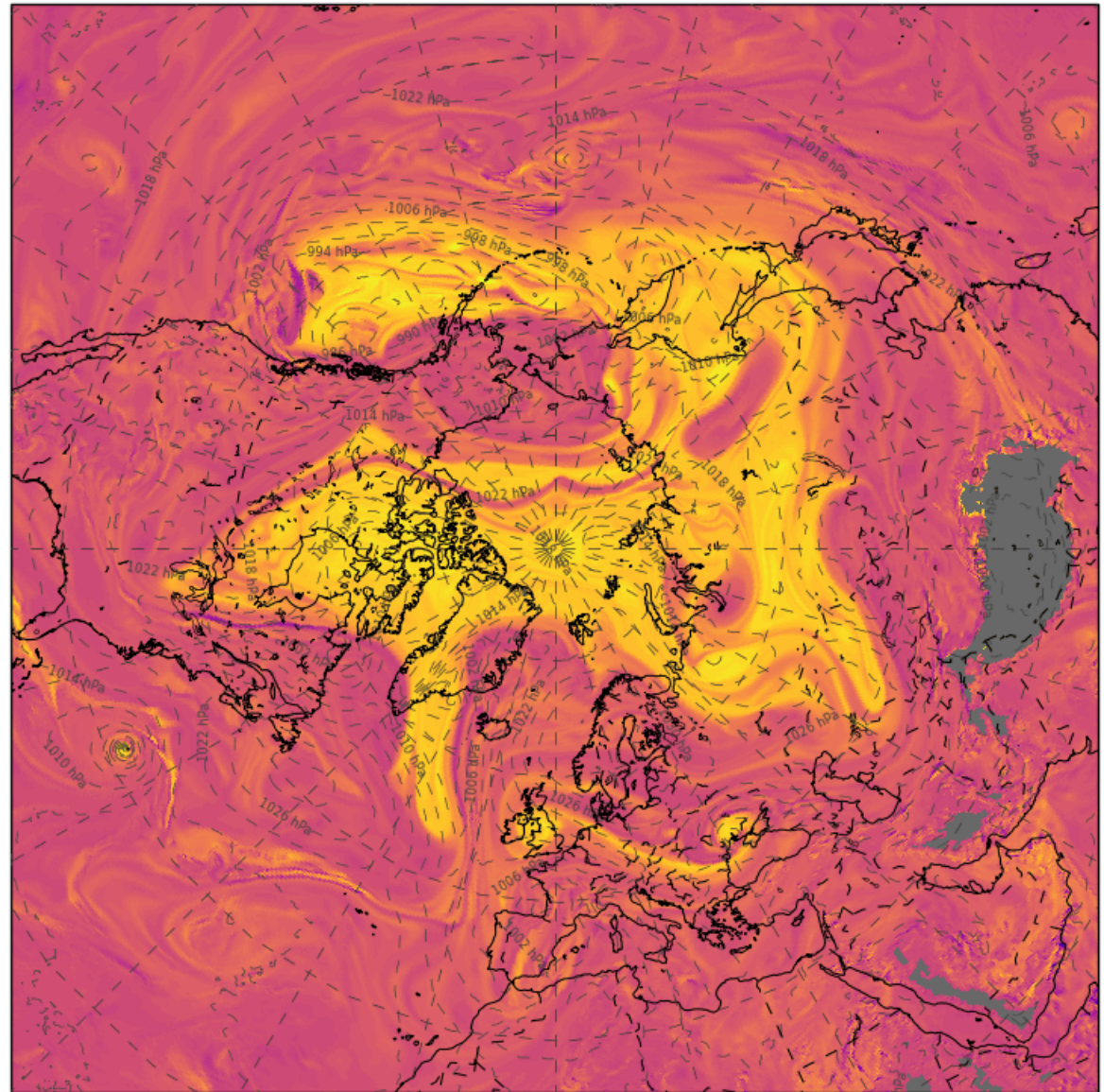
PV Units

PV (315K) NH

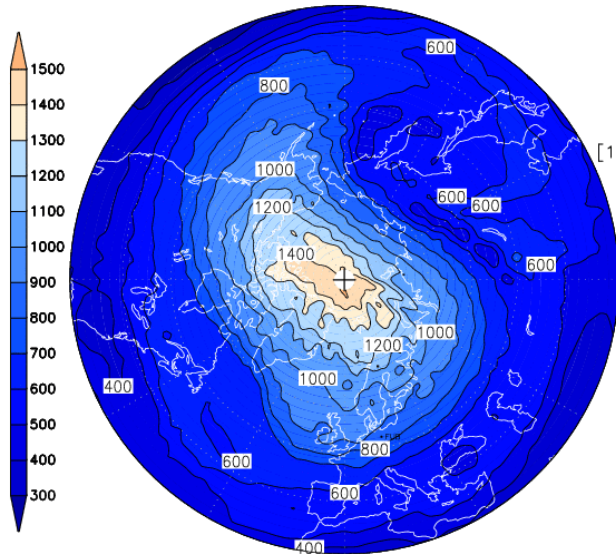
Thursday
12 UT 13/10/16

Poleward extension
reaches Svalbard

Max amplitude
wavenumber 2?



PV (315K) NH

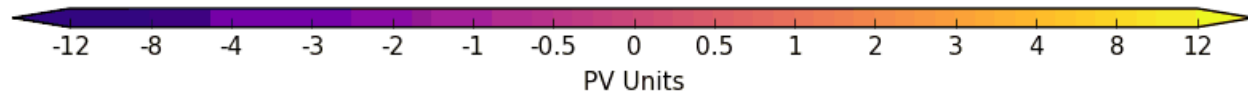
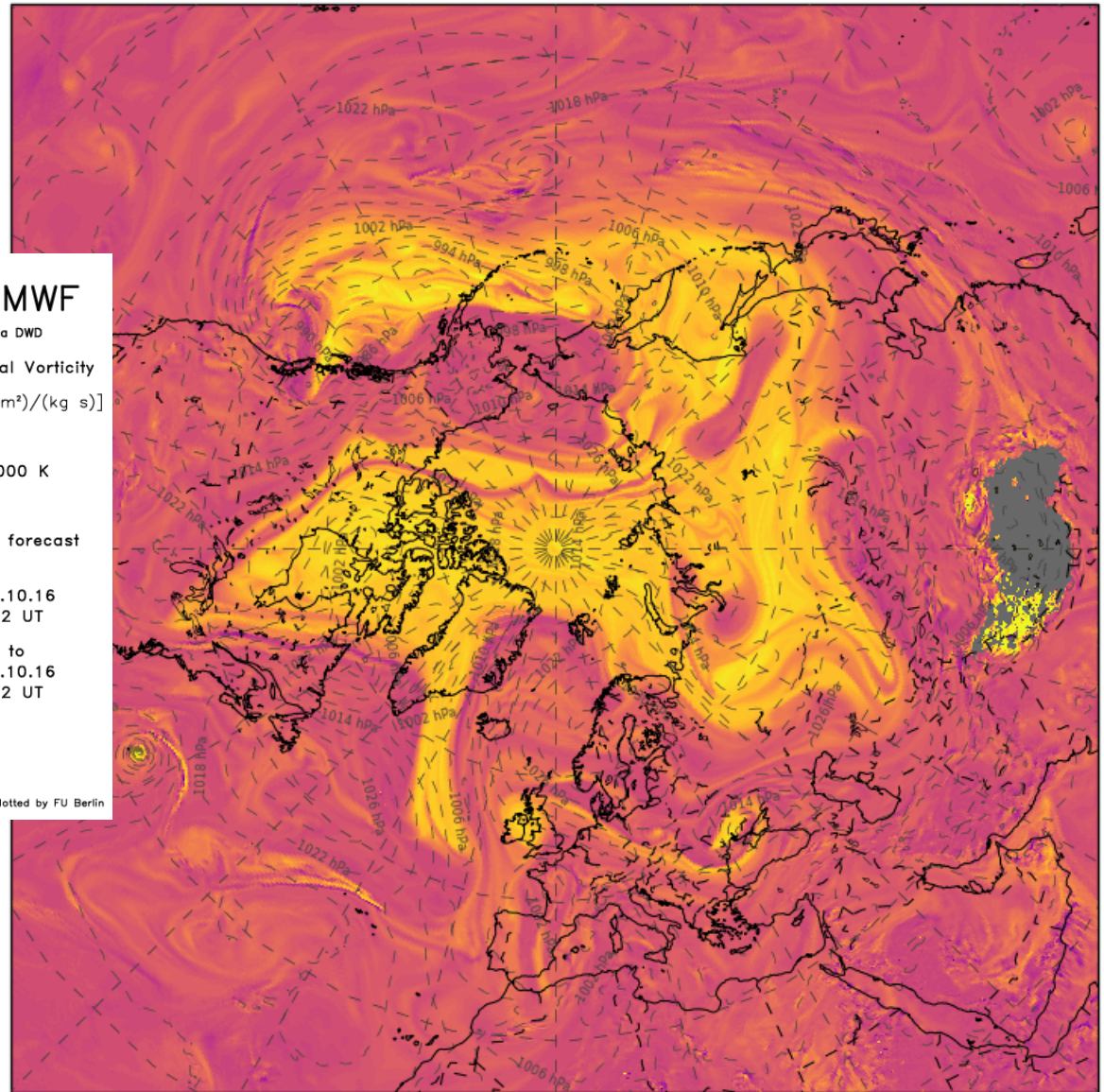


ECMWF
via DWD
potential Vorticity
[$10^{-6} (\text{K m}^2)/(\text{kg s})$]

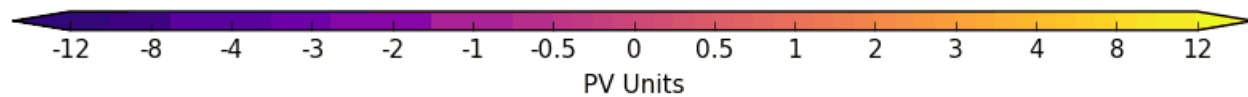
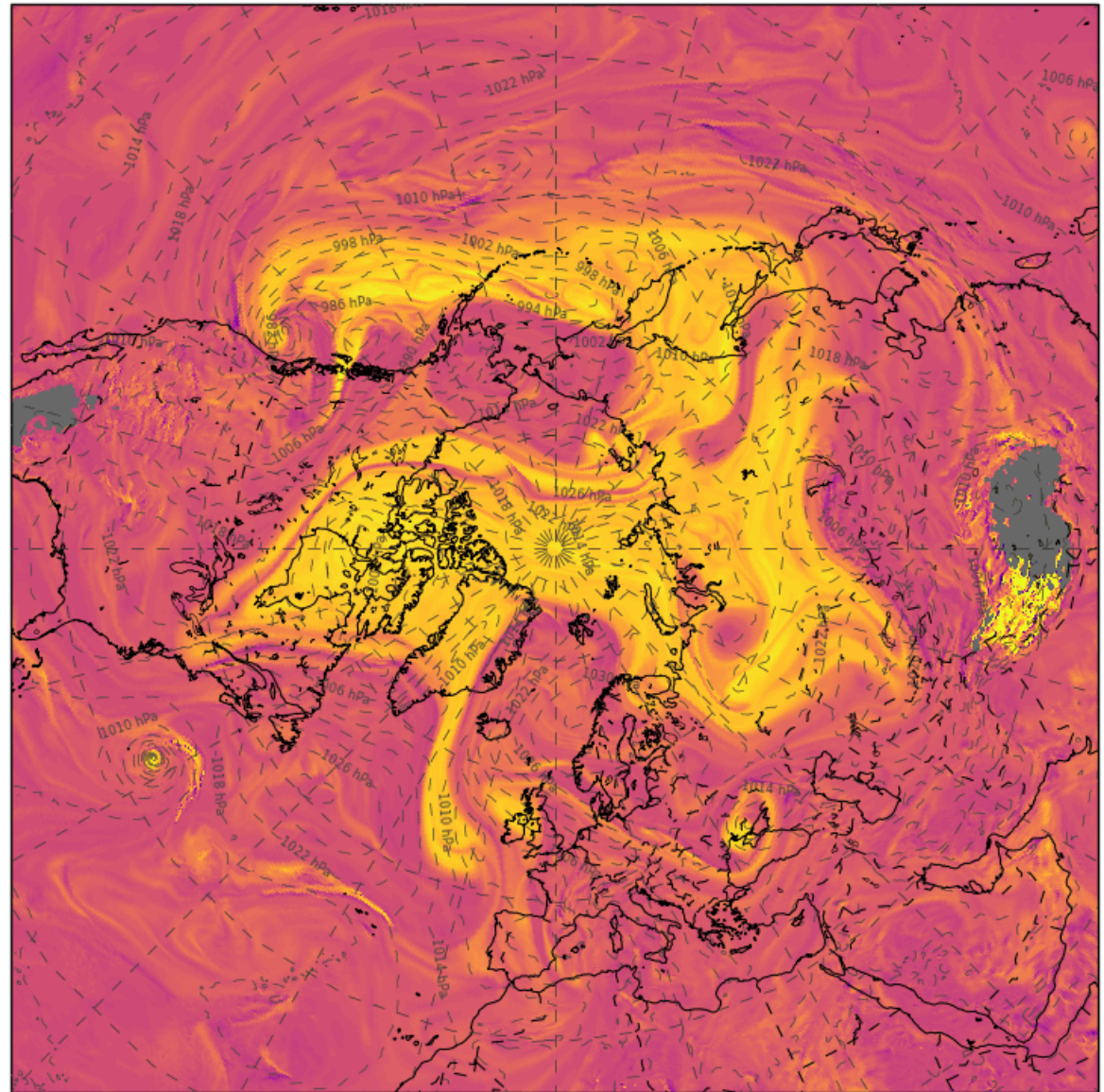
1000 K
72 h forecast

10.10.16
12 UT
to
13.10.16
12 UT

calculated and plotted by FU Berlin

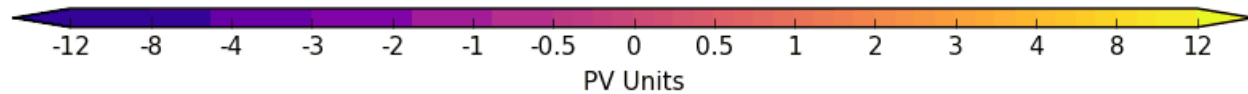
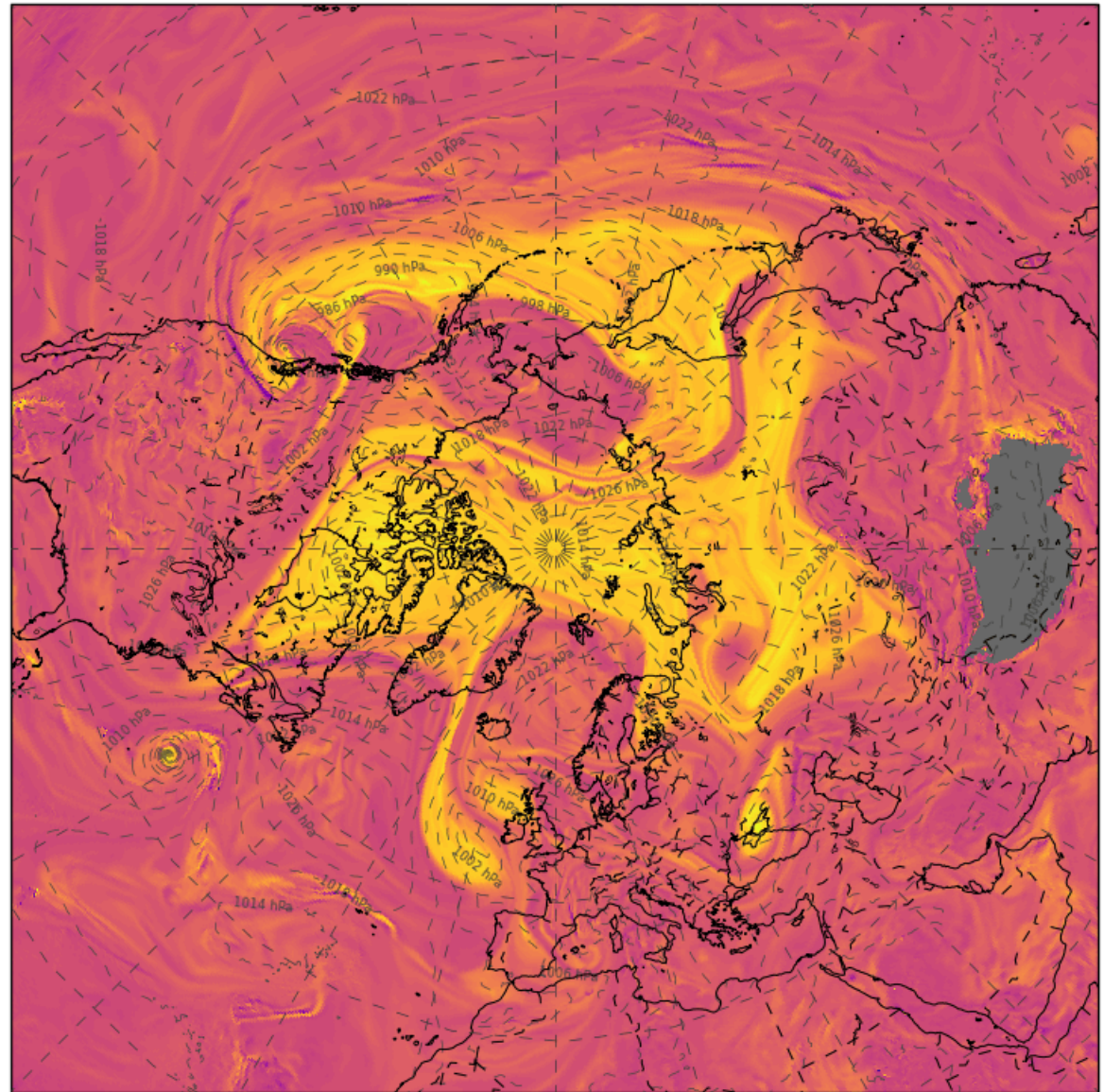


PV (315K) NH



PV Units

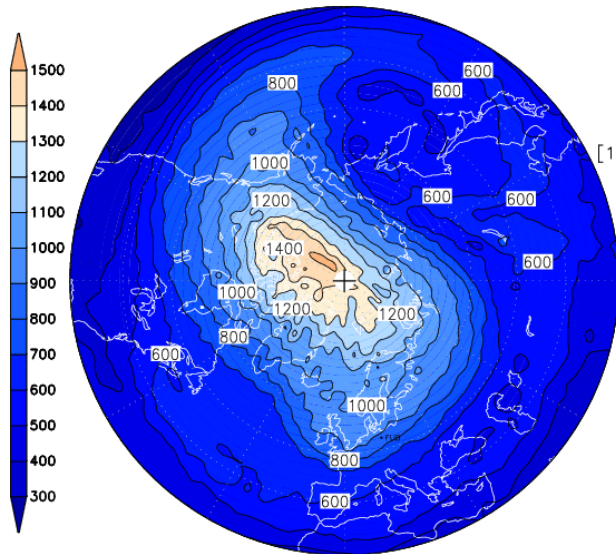
PV (315K) NH



PV Units

PV (315K) NH

Friday
12 UT 14/10/16



ECMWF

via DWD

potential Vorticity
[$10^{-6} (\text{K m}^2)/(\text{kg s})$]

1000 K

96 h forecast

10.10.16

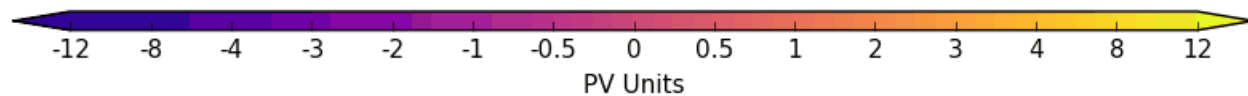
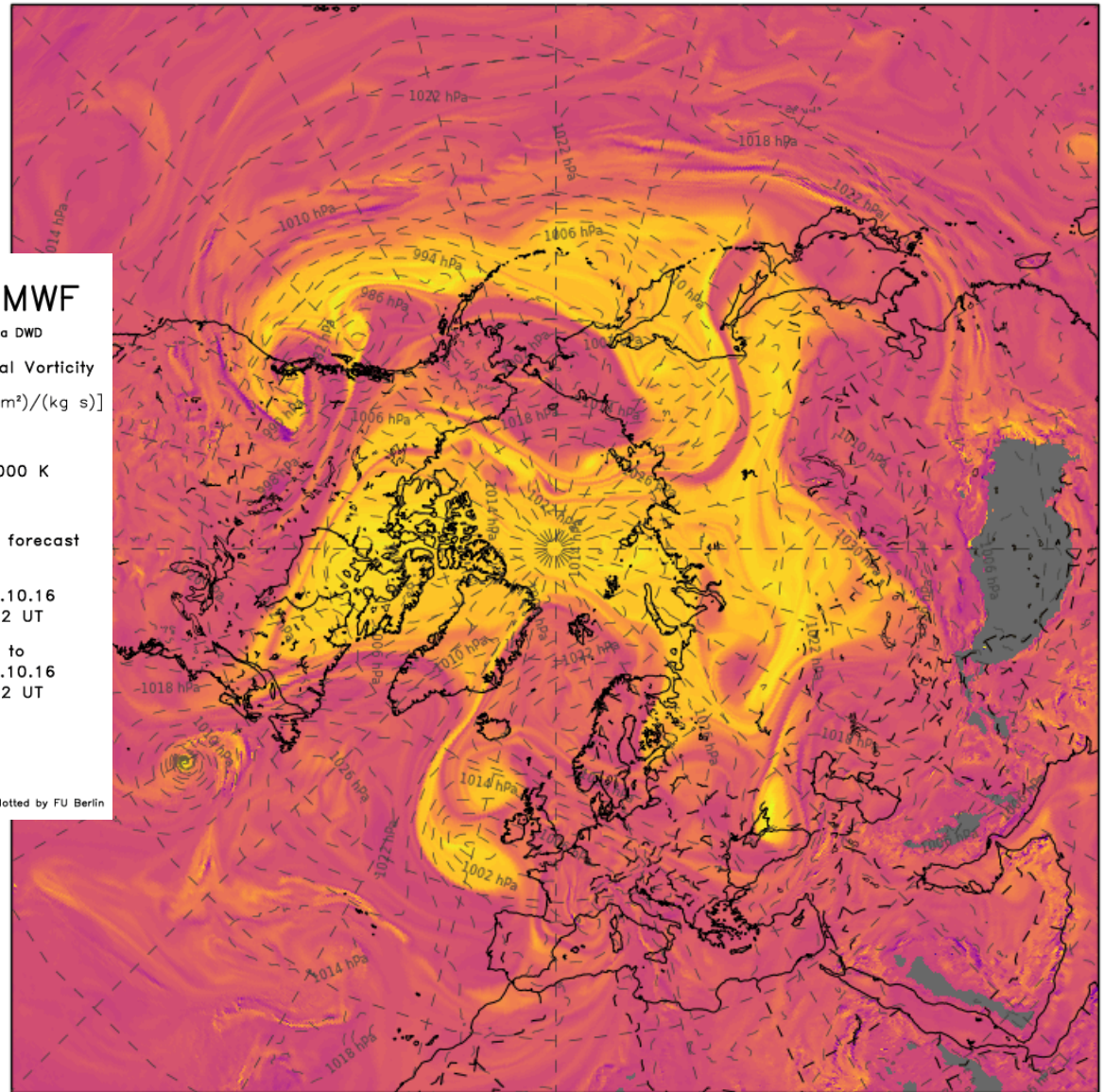
12 UT

to

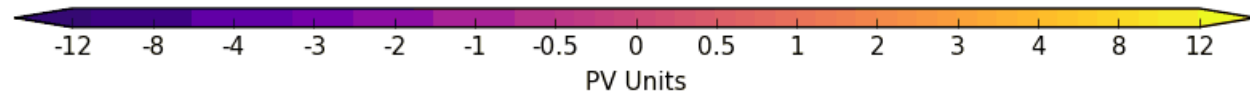
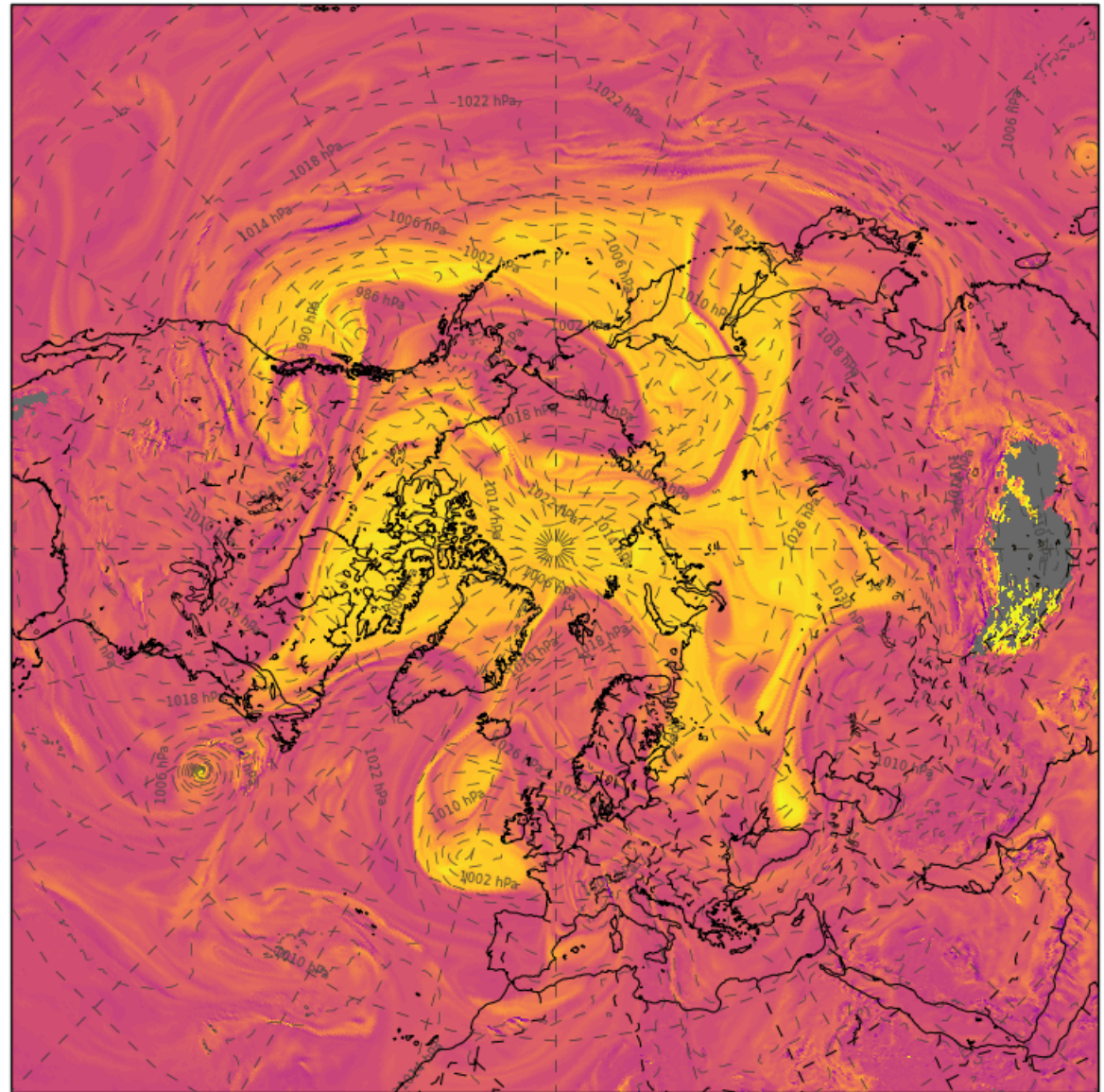
14.10.16

12 UT

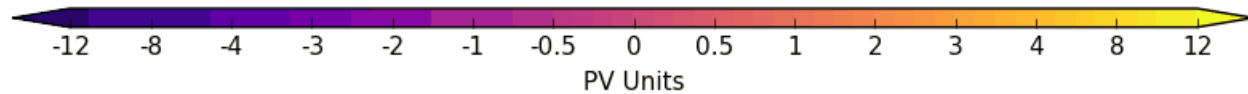
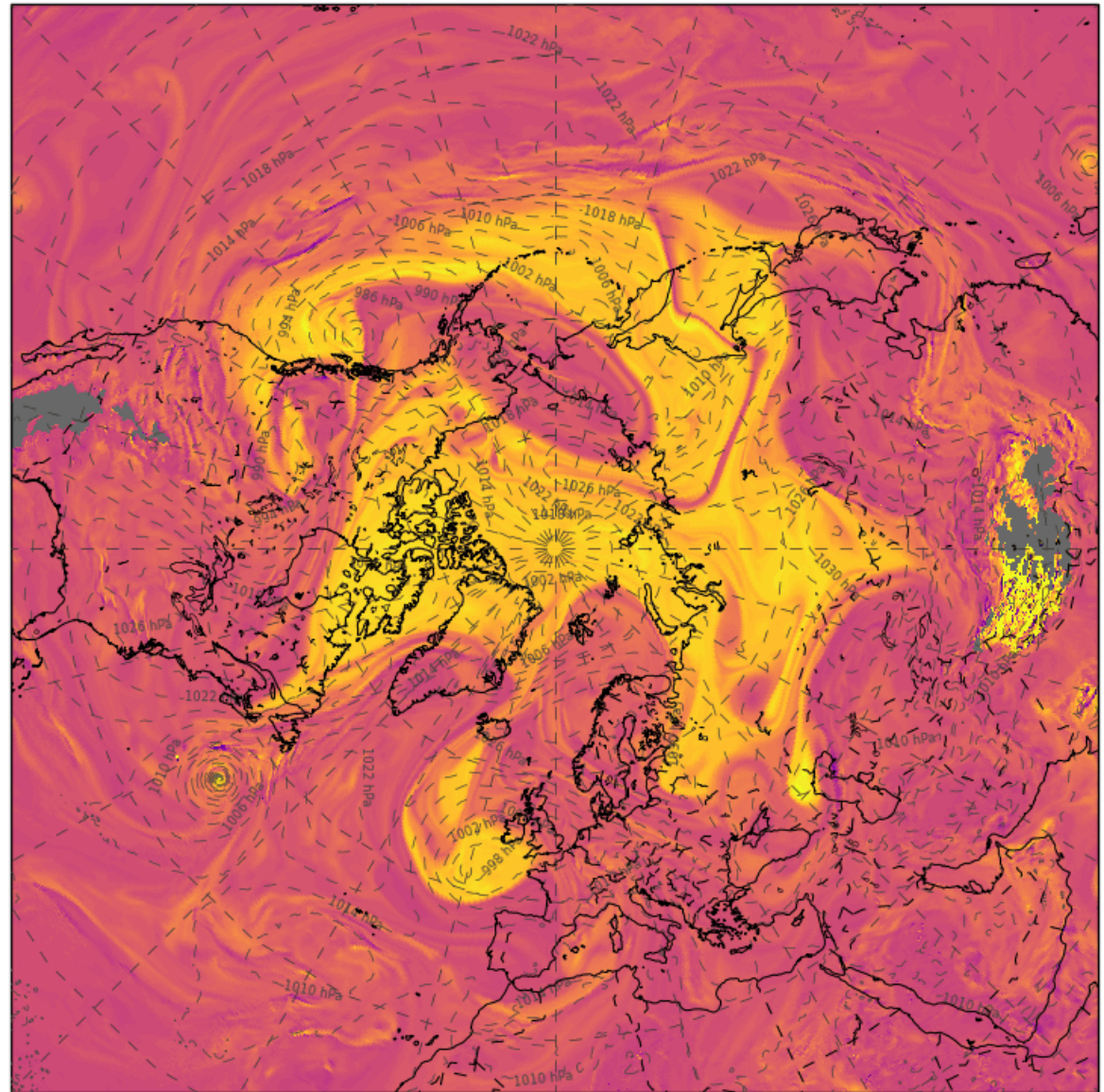
calculated and plotted by FU Berlin



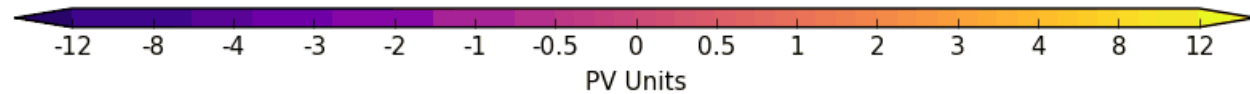
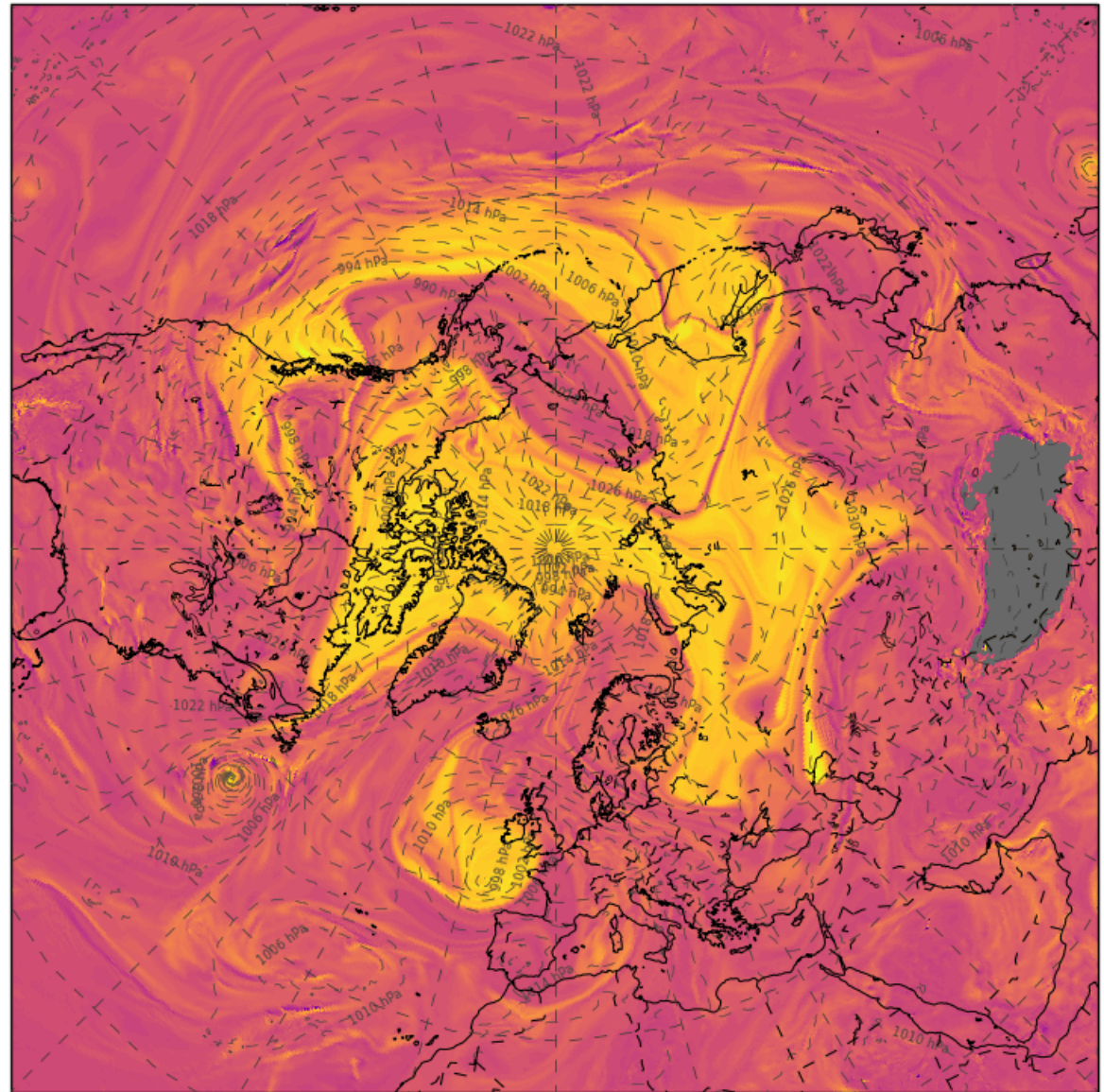
PV (315K) NH



PV (315K) NH

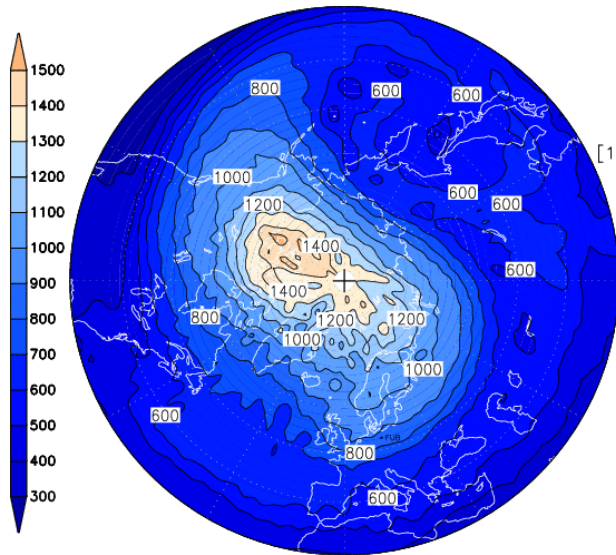


PV (315K) NH



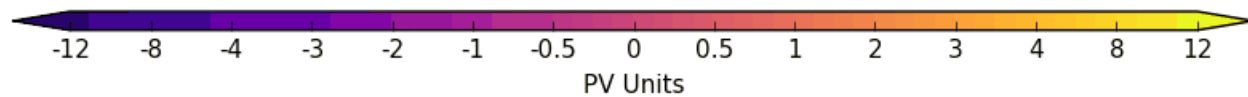
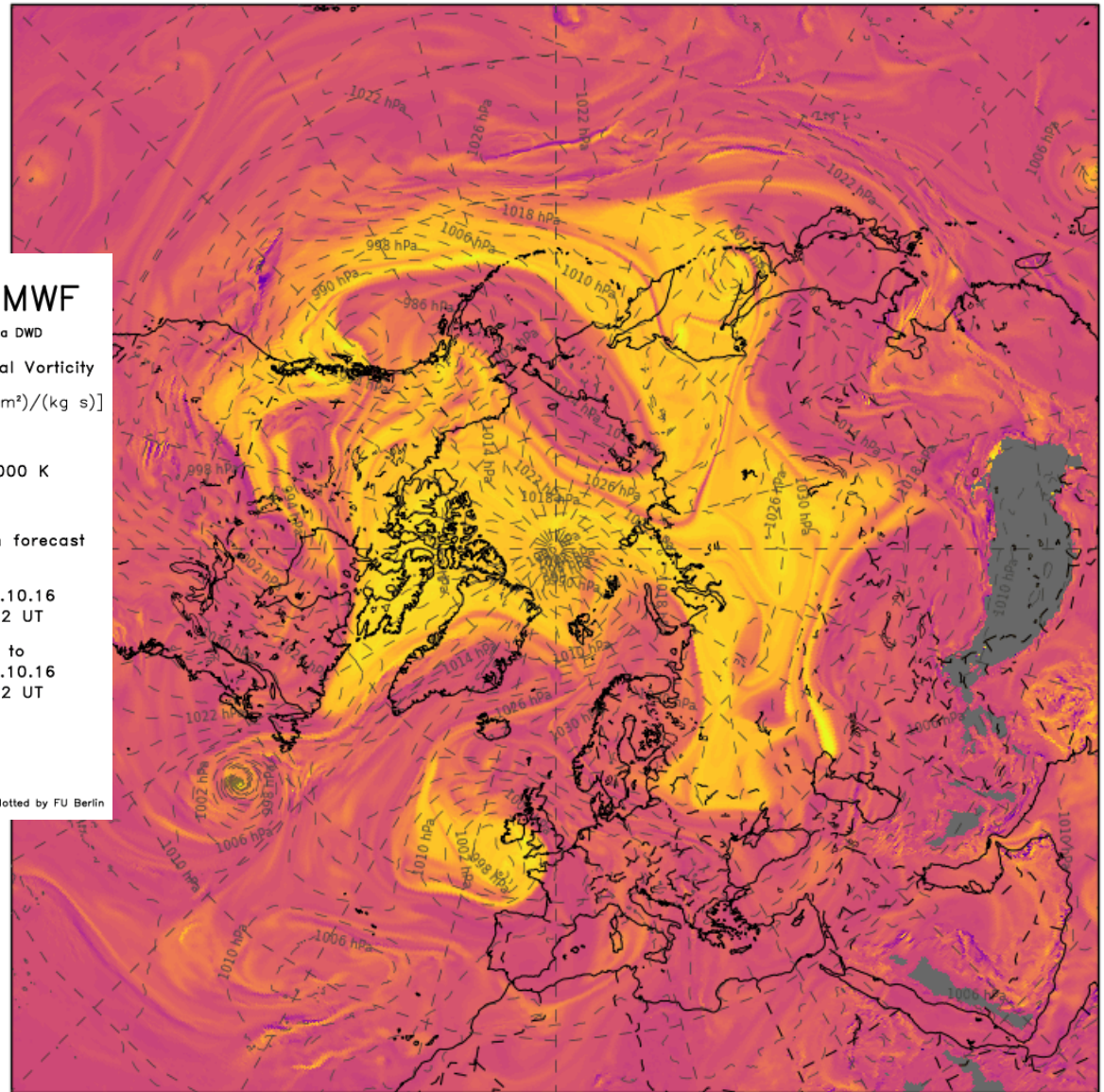
PV (315K) NH

Saturday
12 UT 15/10/16



ECMWF
via DWD
potential vorticity
[$10^{-6} (\text{K m}^2)/(\text{kg s})$]
1000 K
120 h forecast
10.10.16
12 UT
to
15.10.16
12 UT

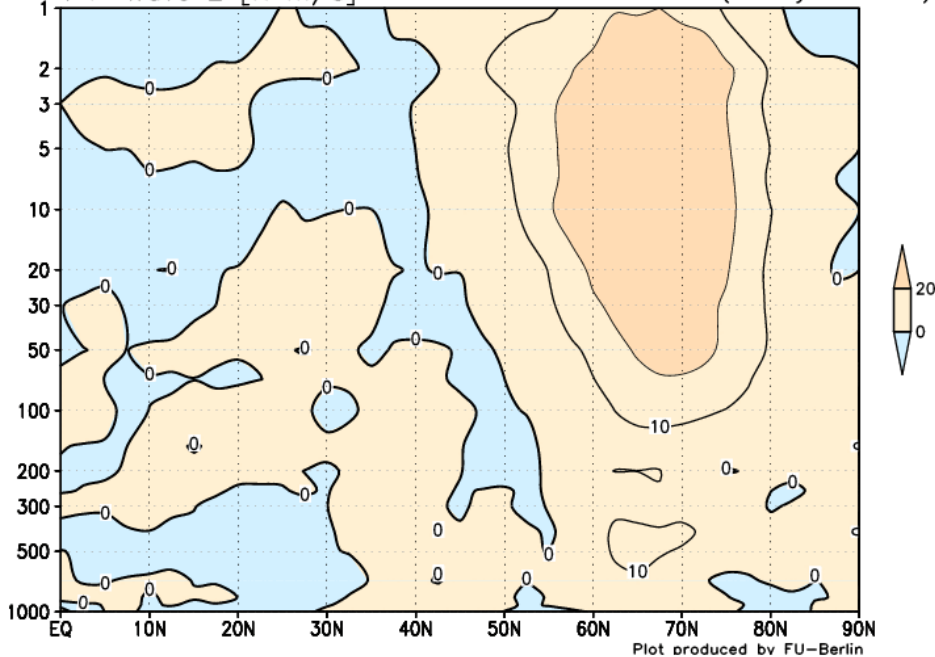
calculated and plotted by FU Berlin



Wavenumber 2

ECMWF 12 UTC Zonal Mean State: OCT/13/2016

$\nabla T'$ Wave 2 [K m/s] (3-day forecast)



Thursday

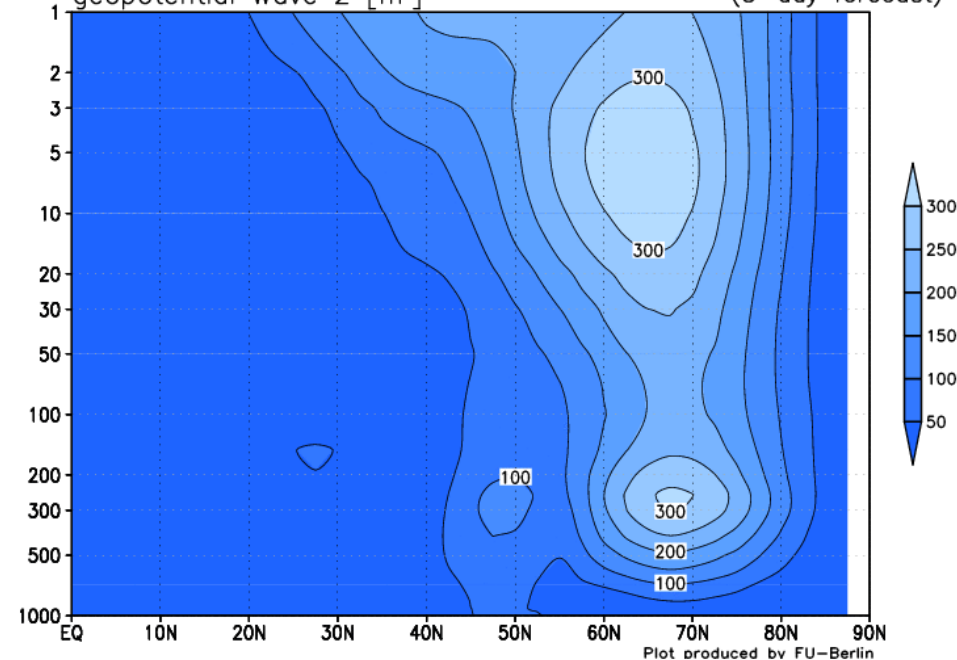
12 UT 13/10/16

Maximum upwards wave activity
flux in both strat and trop.

Upwards RW propagation and
coupled trop-strat mode?

ECMWF 12 UTC Zonal Mean State: OCT/15/2016

geopotential Wave 2 [m'] (5-day forecast)



Saturday

12 UT 15/10/16

Maximum amplitude