

**Welcome to the
third Online Presentation
of the Polarstern-Project
2 May 2012**

**Peter Schmitt
DWD - Langen**



Agenda



- Introduction of 3 important people on board
- Meteorological information 26-04 ... 01.05.
- Focus to the Dust Storm



Karl Bumke: Chief Scientist from the Helmholtz-Center for Ocean Research in Kiel

- Weather forecasts on board are very important for planning the scientific work. The forecasts give us enough time for an alternative planning
- Storms are the most impressive weather phenomena
- Twice I saw a green flash after sunset
- Weekly Reports from Karl Bumke about working and living on board

Weekly Reports

[16 April 2012](#): From Punta Arenas to the open sea

[23 April 2012](#): In the South Atlantic

[30 April 2012](#): Crossing the equator

http://www.awi.de/en/infrastructure/ships/polarstern/weekly_reports/



Juliane Hempelt from DWD

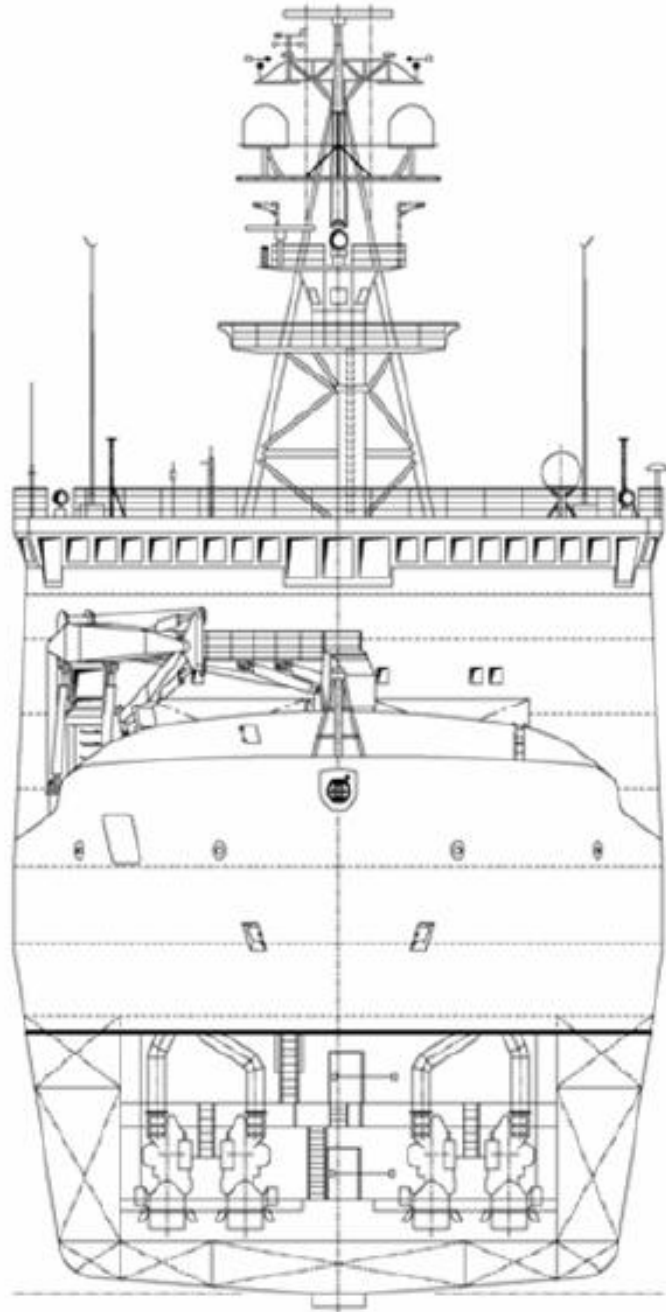
- Weather technician / -observer
- She is responsible for observations, SYNOP Radiosoundings, TEMP
- She is the first time on Polarstern
- Juliane crosses the first time the equator ...
- „I'm looking forward to wave heights of more than 4 m.“
- She makes most of the fotos for us.

RV Polarstern: 3 Data Pools

- 10 minutes mean values, automatic dates
e.g. height, ceiling, pressure, precipitation, temperature, ...
data managementsystem „DAVIS-SHIP“
- Weather observation every 3 hours (FM13 Synop) for
GTS, many observations with eyes, e.g. ice coverage
- Radiosoundings: per day 1 or 2,
in this cruise 1: every day at 12 UTC
Maximum height: 25 – 37 km
Sometimes extra soundings with smaller
ballons for the briefing of helicopter pilots,
mostly in the Arctic and Antarctic.



Grafical exposure with the position of the measurements



- 39 m ——— Wind
- 34 m ——— { Global radiation
Precipitation
- 29 m ——— Moisture,
Temperature
- 20 m ——— { Visibility
Ceiling
- 16 m ——— Weather station
- 10 m ——— Balloon hall
- 0 m ——— Sea level
- 5 m ——— Water temperature

Max Miller from DWD

- Meteorologist (forecaster)
- First time on Polarstern 2006
- On the first cruise he saw wave heights up to 15 m.
- In the Arctic and Antarctic he is also an aviation forecaster for the helicopter.
- The meteorologist is always on duty



Copyright Juliane H



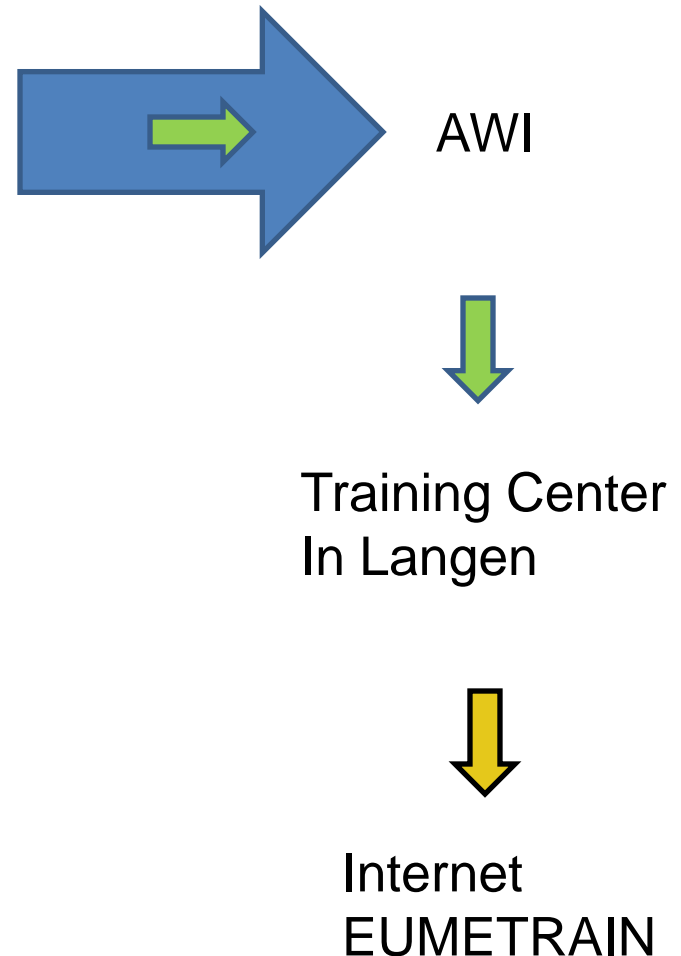
Data path from Polarstern to EUMETRAIN



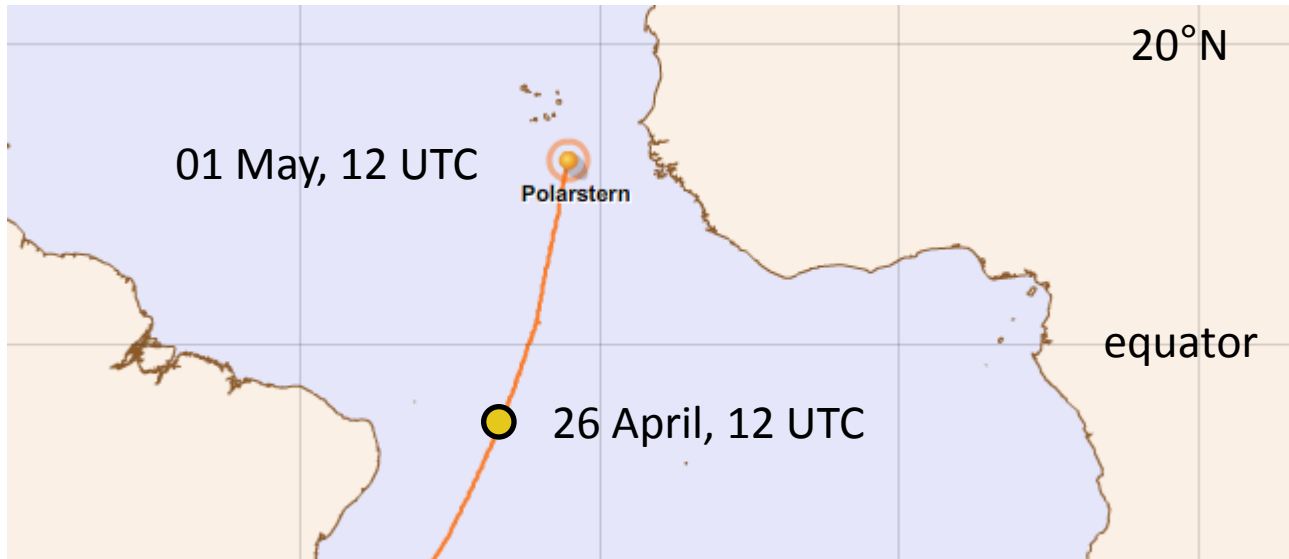
Fütterer, Fahrbach: Polarstern:

Permanent Line from Polarstern to AWI
in Bremerhaven.
But the quality is not constant, because the
vessel is in motion.

Big E-Mail packet for
many people

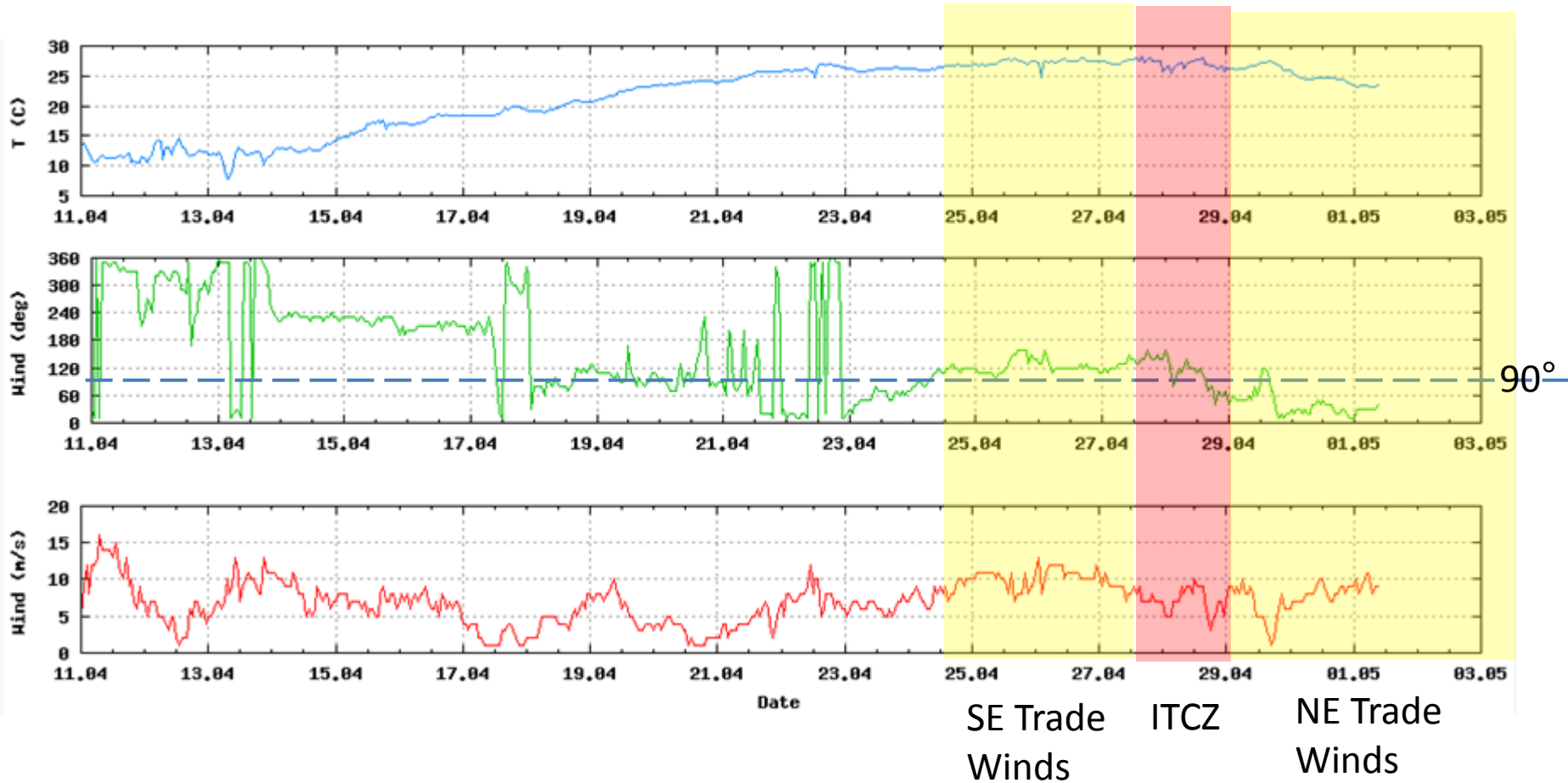


Meteorological information from 26 April

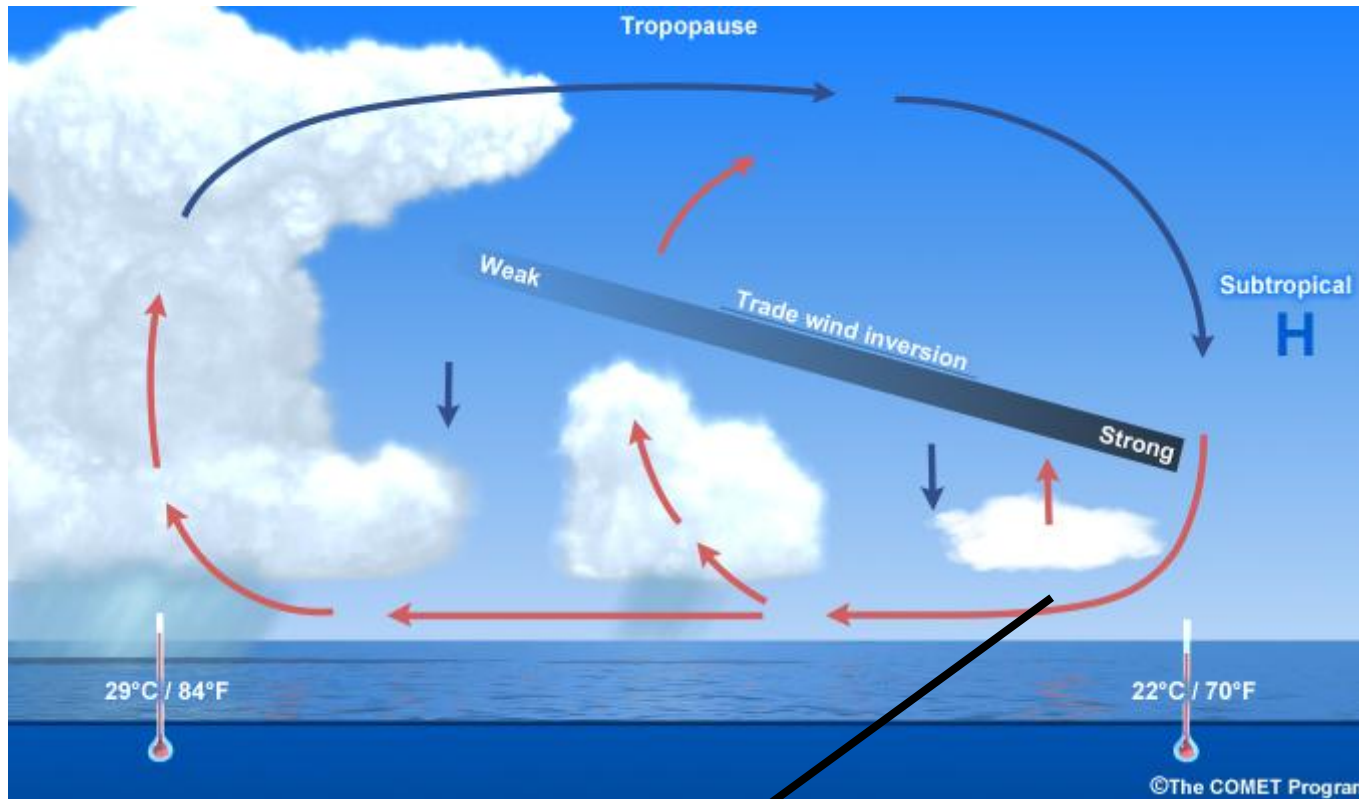


26 April, 12 UTC: Polarstern is still sailing the **southeast trade winds**. Southeast 5 to 6 Bft. Good visibility, isolated showers, swell 2 to 2.5 m.

1-hourly Routine Synoptic Observations Polarstern (DBLK)



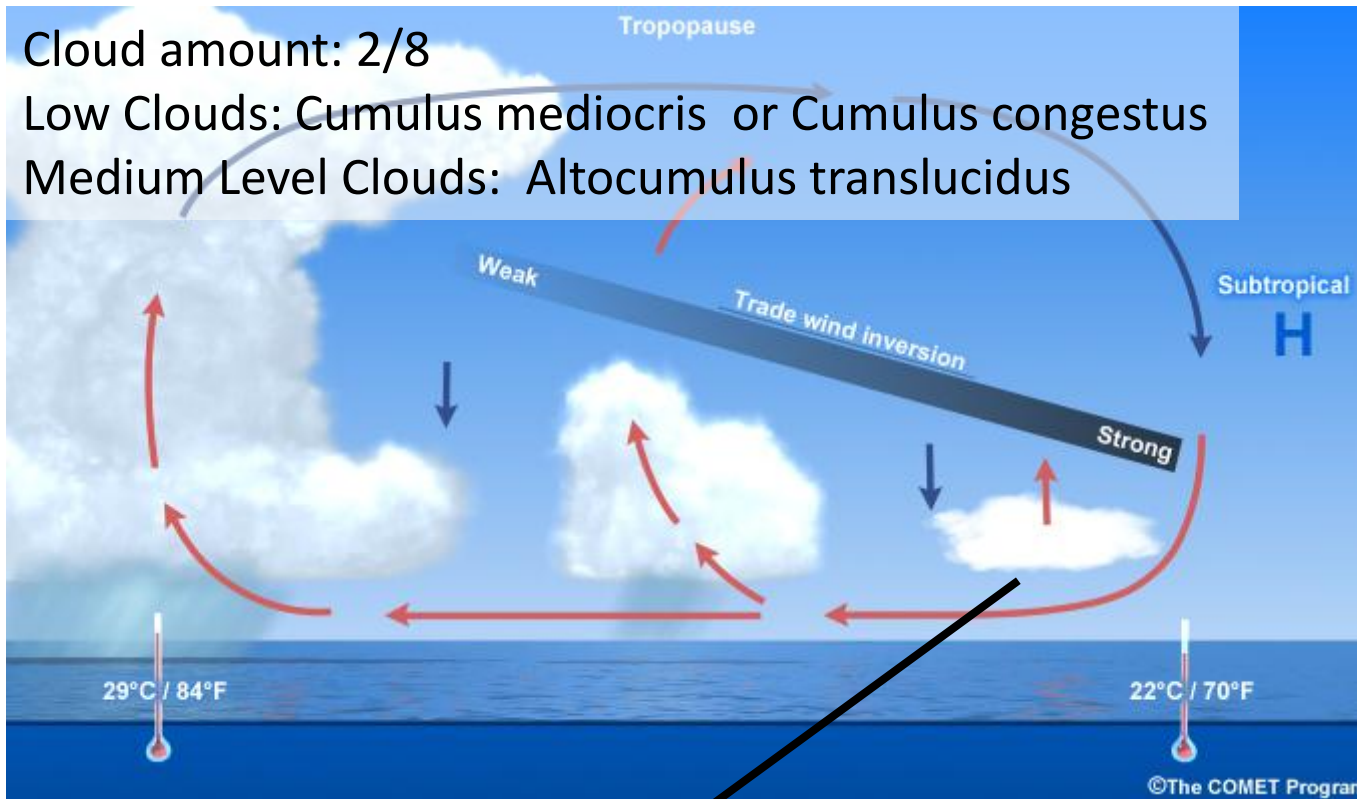
Vertical profile of the Trade wind inversion



DBLK 26121 99050 50266 41598 21211 10275
20228 40127 52008 70300 82230 22282 04279
20402 310// 40703 =

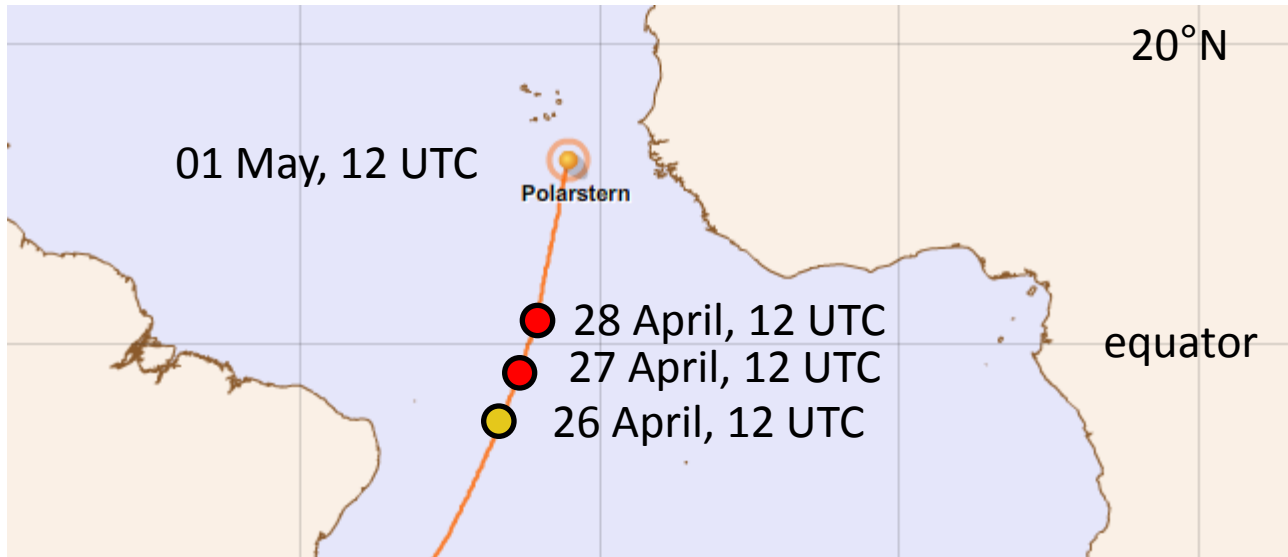
Please decode this
cloud group in
FM13 Synop (blue
background)

Vertical profile of the Trade wind inversion



DBLK 26121 99050 50266 41598 21211 10275
20228 40127 52008 70300 82230 22282 04279
20402 310// 40703 =

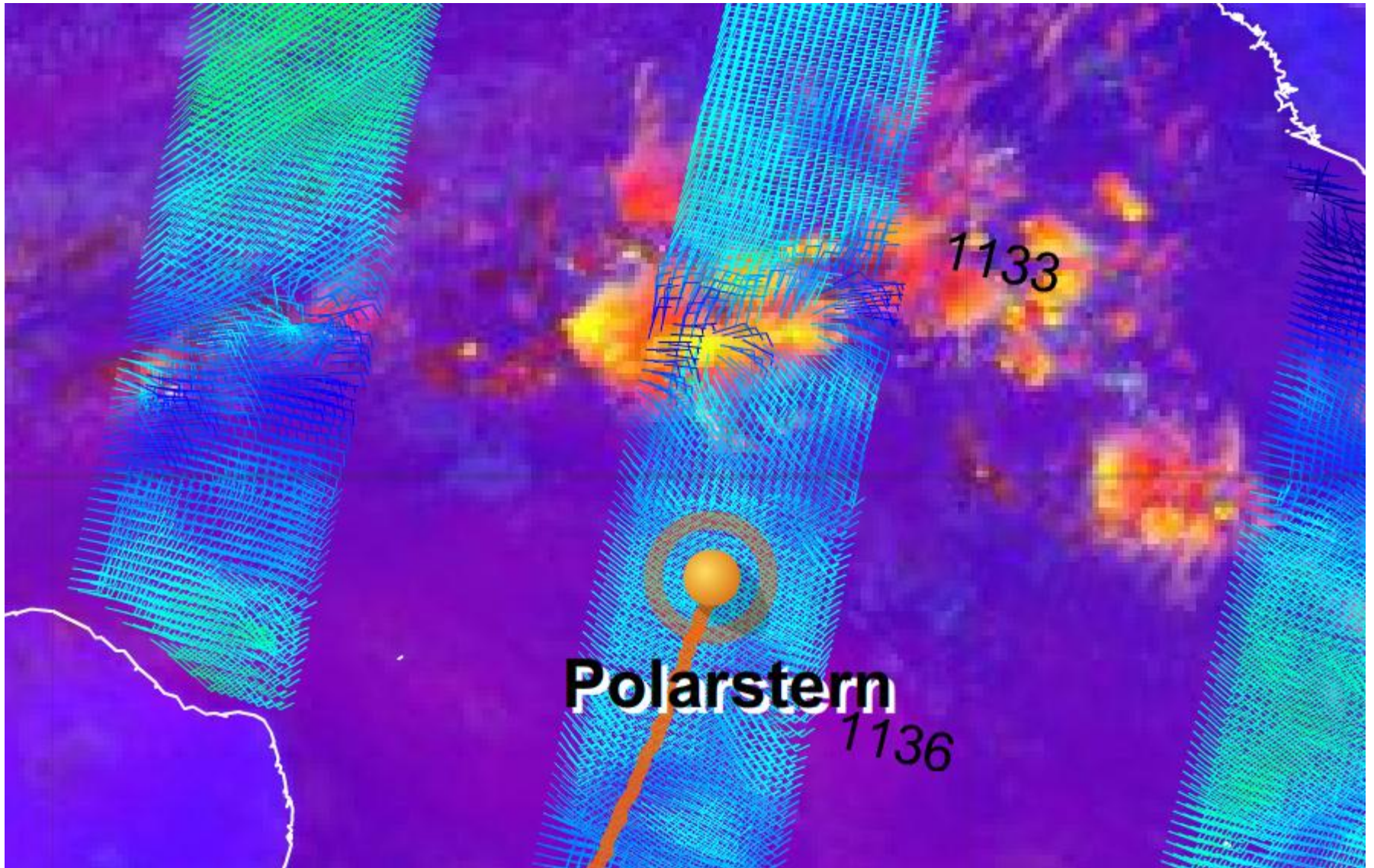
Meteorological information from 27 to 28 April



27 April, 12 UTC: Polarstern is **entering the inter tropical convergence zone**. Southeast to east 4 to 5 Bft. Good visibility, reduced by showers or thunderstorms. Swell 1.5 to 2 m.

28 April, 12 UTC: Polarstern is **crossing the inter tropical convergence zone** and will approach the northeast trade wind zone. East to northeast around 4 Bft. Good visibility, reduced by some showers or thunderstorms. Swell around 1.5 m.

27-04-2012, 12 UTC, RGB Severe Convection, ASCAT

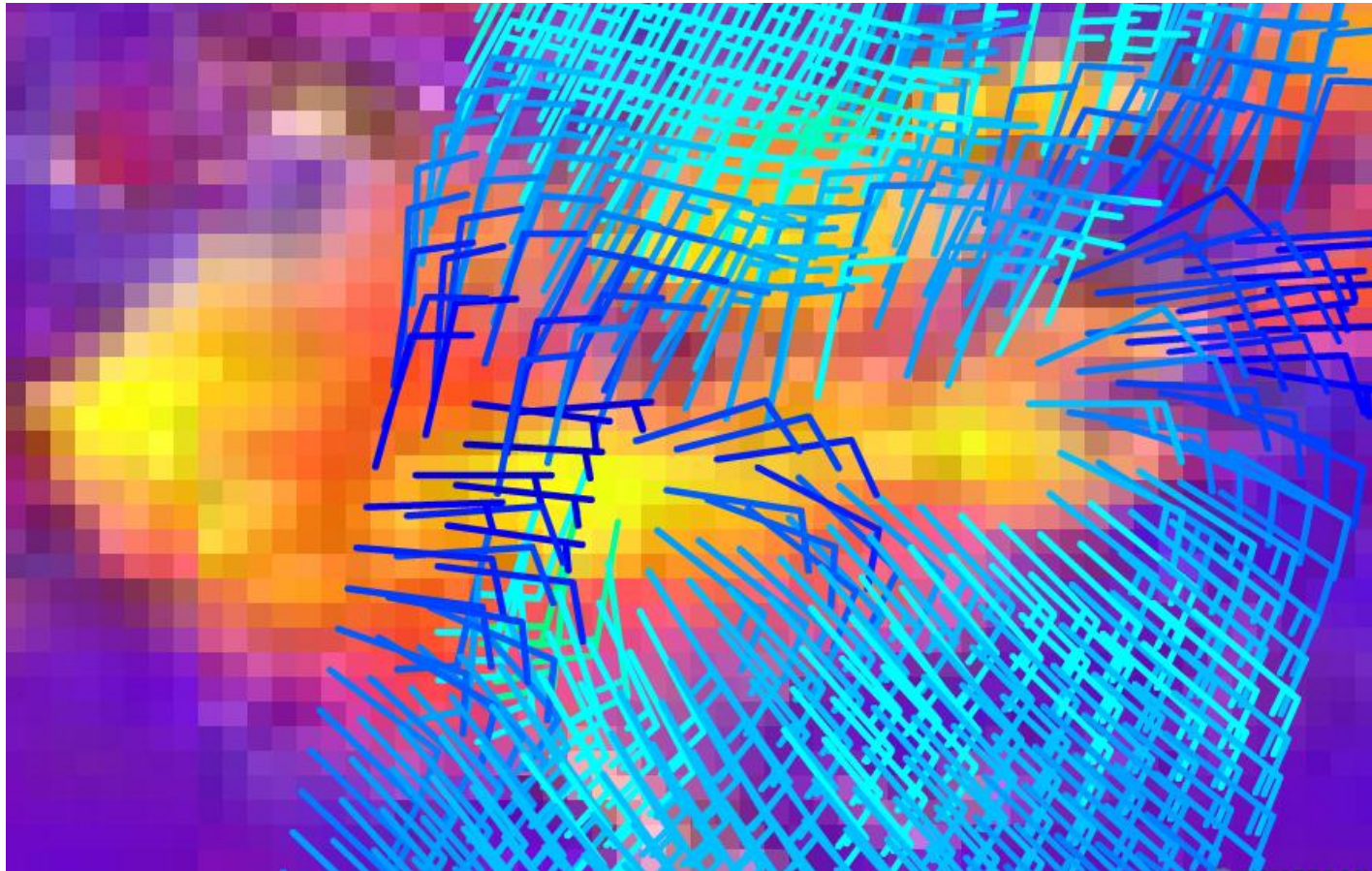




27-04-2012, 12 UTC, RGB Severe Convection, ASCAT

What shows the yellow colour?

- a) big ice particle b) small ice particle c) cold temperature

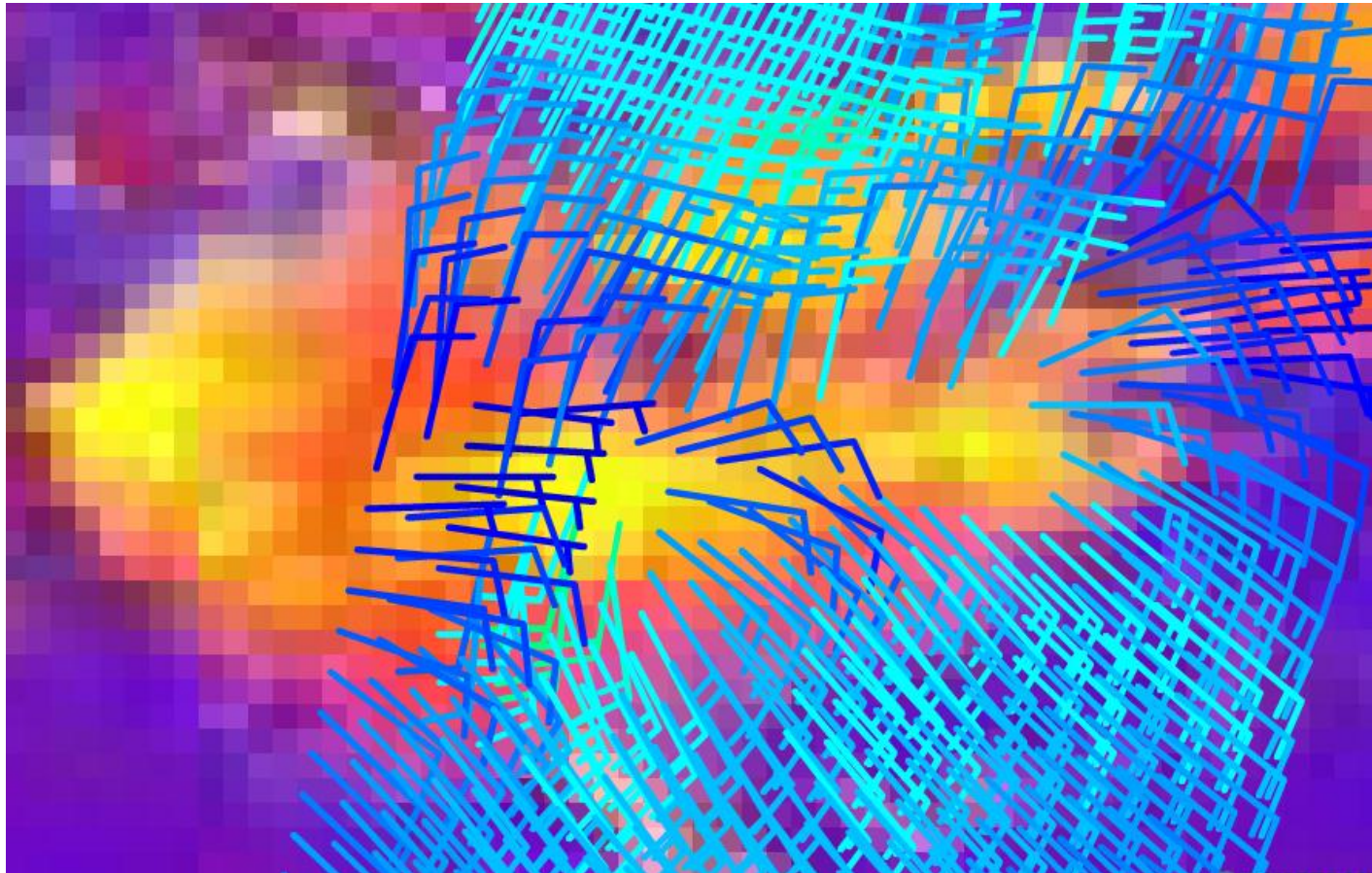




27-04-2012, 12 UTC, RGB Severe Convection, ASCAT

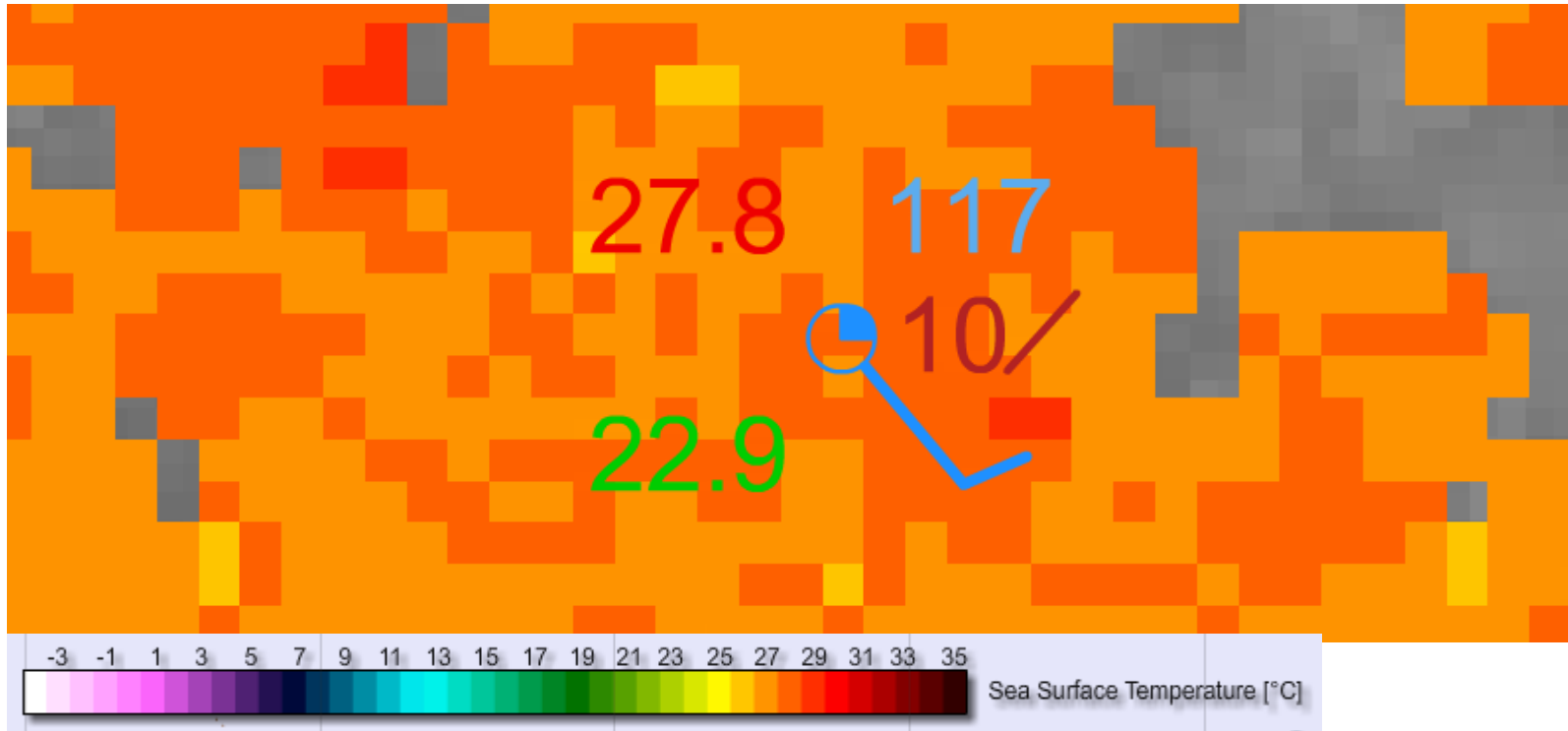
What shows the yellow colour?

- a) big ice particle b) small ice particle c) cold temperature





27-04-2012, 12 UTC, OSI-SAF: SST, Synop

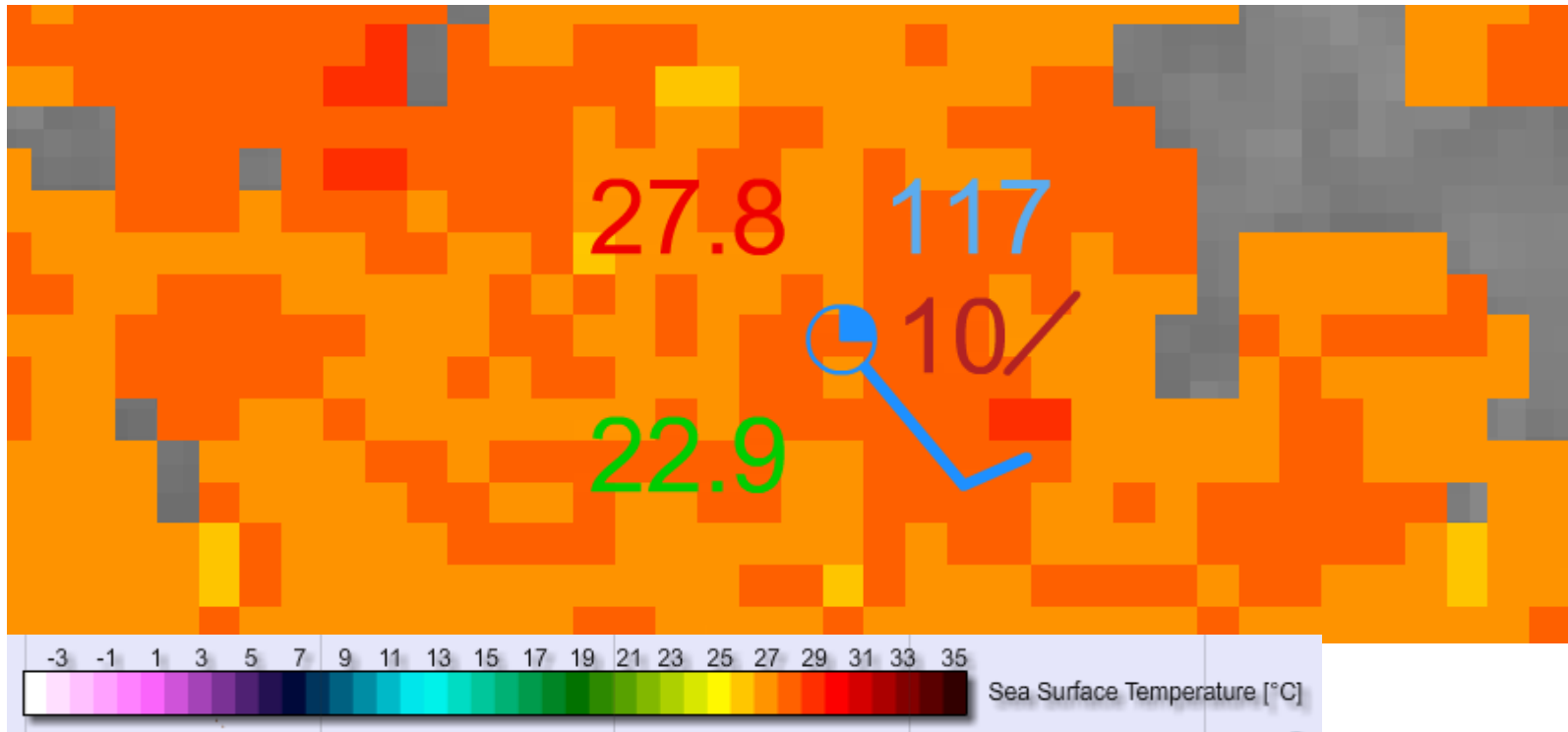


DBLK 27121 99018 50254 41598 21408 10278 20229 40118 52010
70200 82200 22283 04278 20402 312// 40803 =

What is the measurement of water temperature on Polarstern?



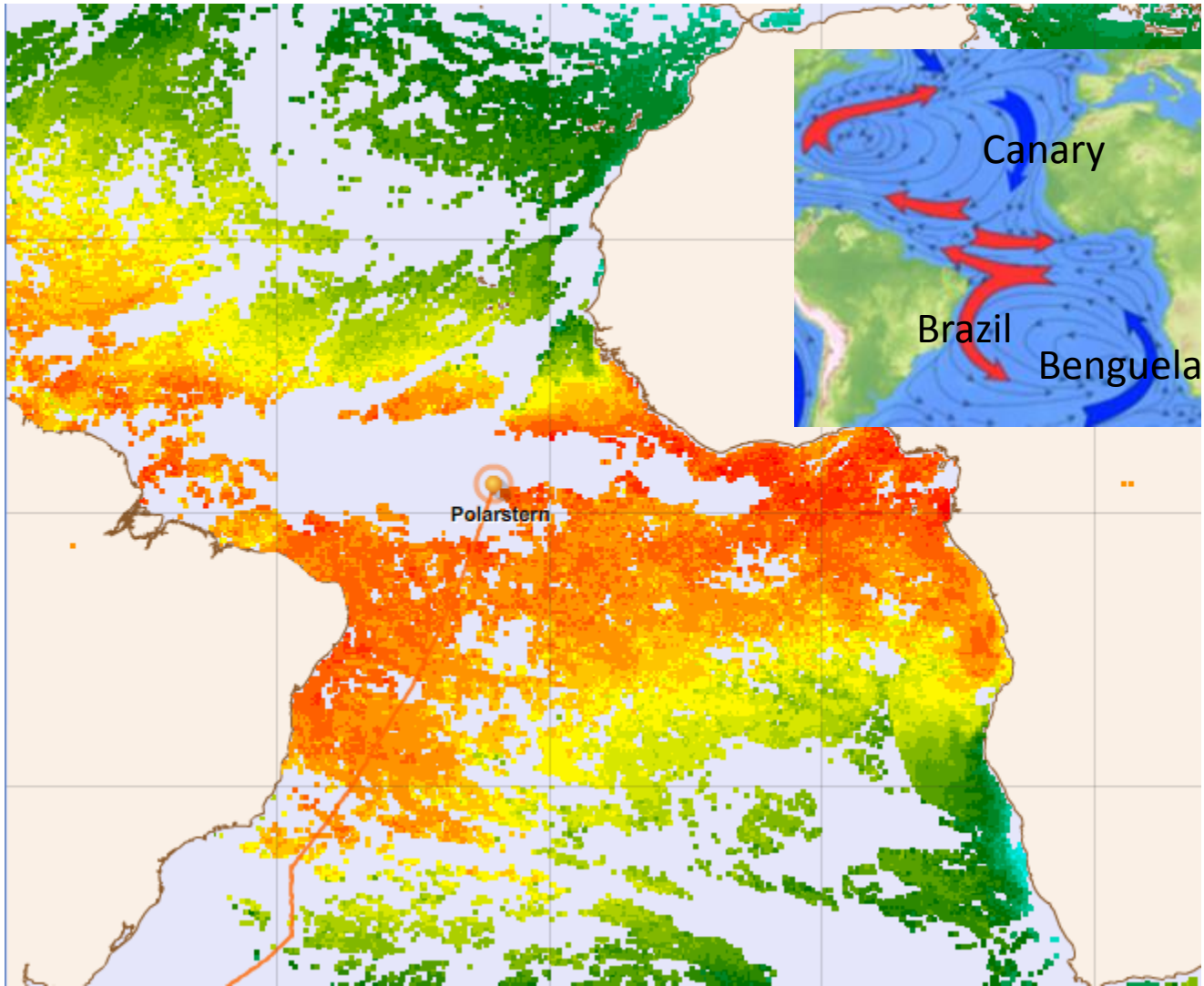
27-04-2012, 12 UTC, OSI-SAF: SST, Synop



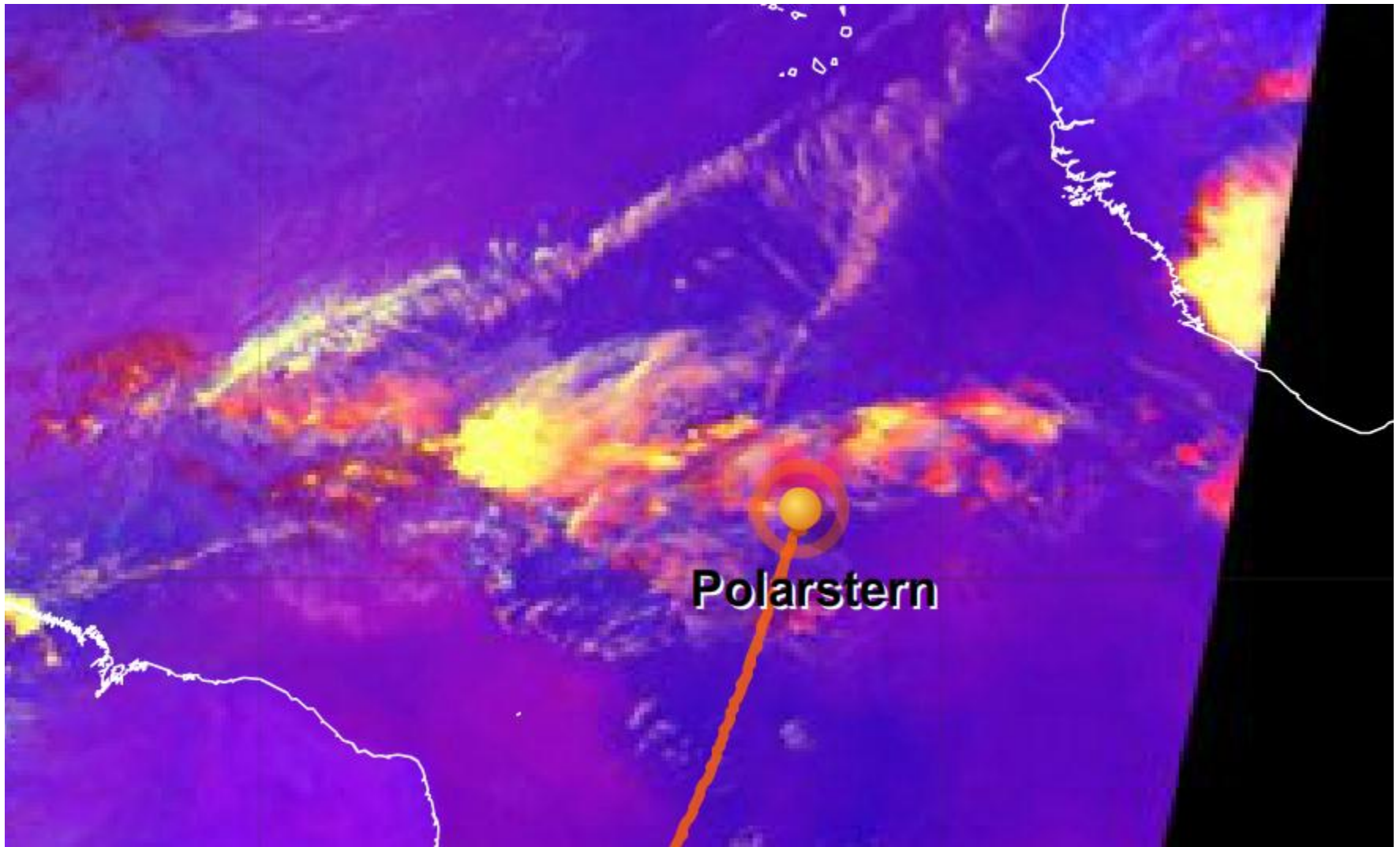
DBLK 27121 99018 50254 41598 21408 10278 20229 40118 52010
70200 82200 22283 04**278** 20402 312// 40803 =

What is the measurement of water temperature on Polarstern?
27,8°C

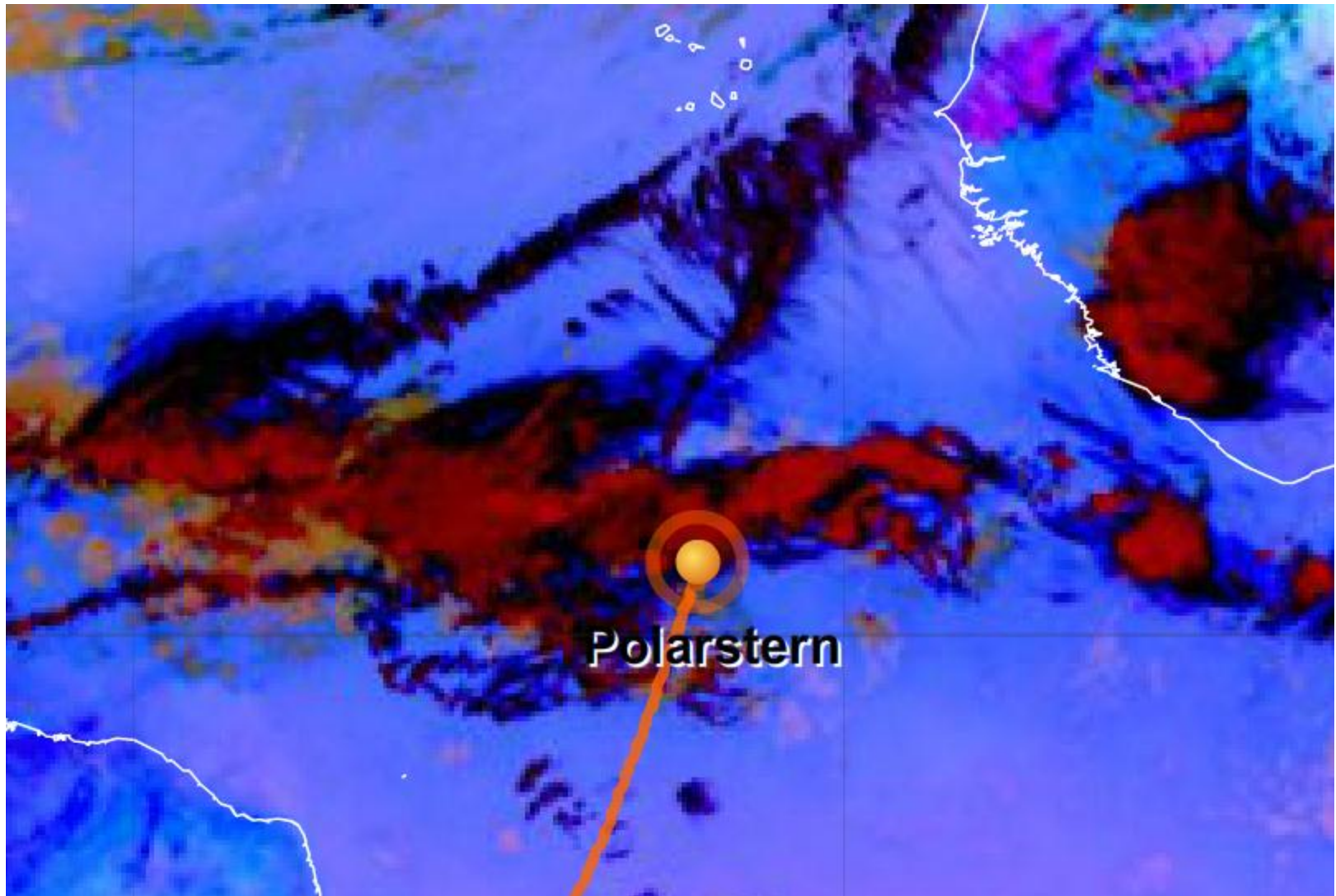
28-04-2012, 18 UTC, OSI-SAF: SST, Sea currents



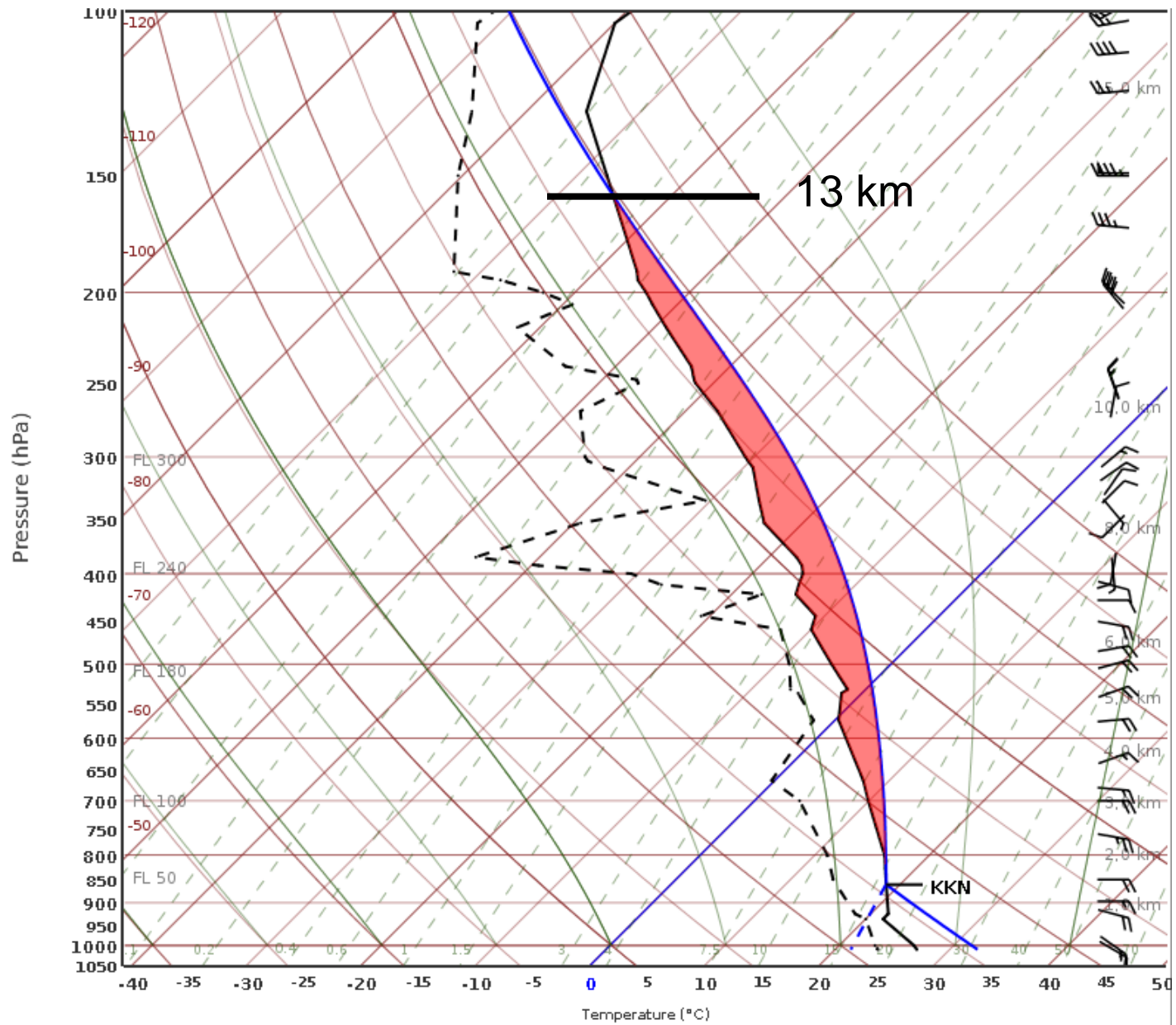
28-04-2012, 18 UTC, Severe Convection RGB



28-04-2012, 18 UTC, Dust RGB



28-04-2012, 18 UTC

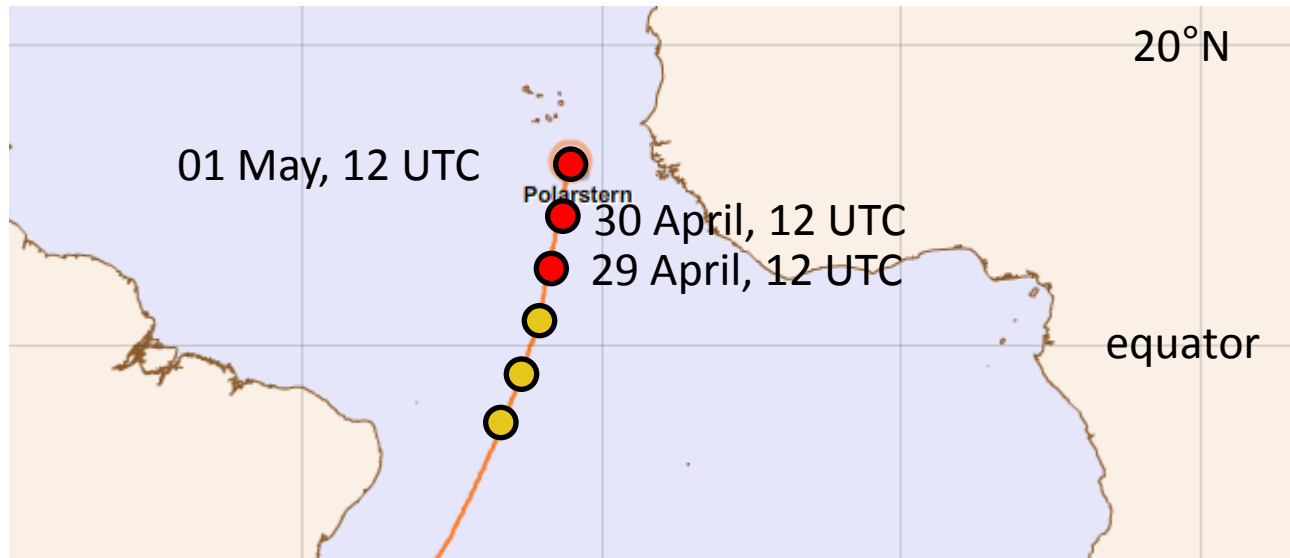


28-04-2012

- no TS observed in the area of ITCZ
- only during the night lightning



Meteorological information from 29 April to 1 May

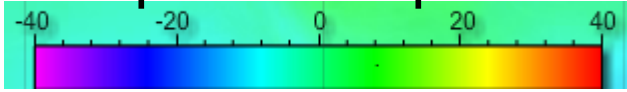


29 April, 12 UTC: Polarstern is **entering the northeast trade** wind zone. Northeast to north 3, increasing 4 to 5 Bft. Good visibility, risk for isolated showers, swell around 1.5 m.

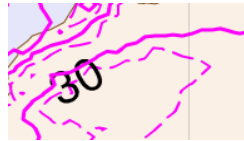
30 April, 12 UTC: Polarstern is **sailing the northeast trade winds**. Northeast to north 4 to 5, increasing 5 to 6 Bft. Temporarily hazy, swell around 2 m.

29-04-2012, 12 UTC

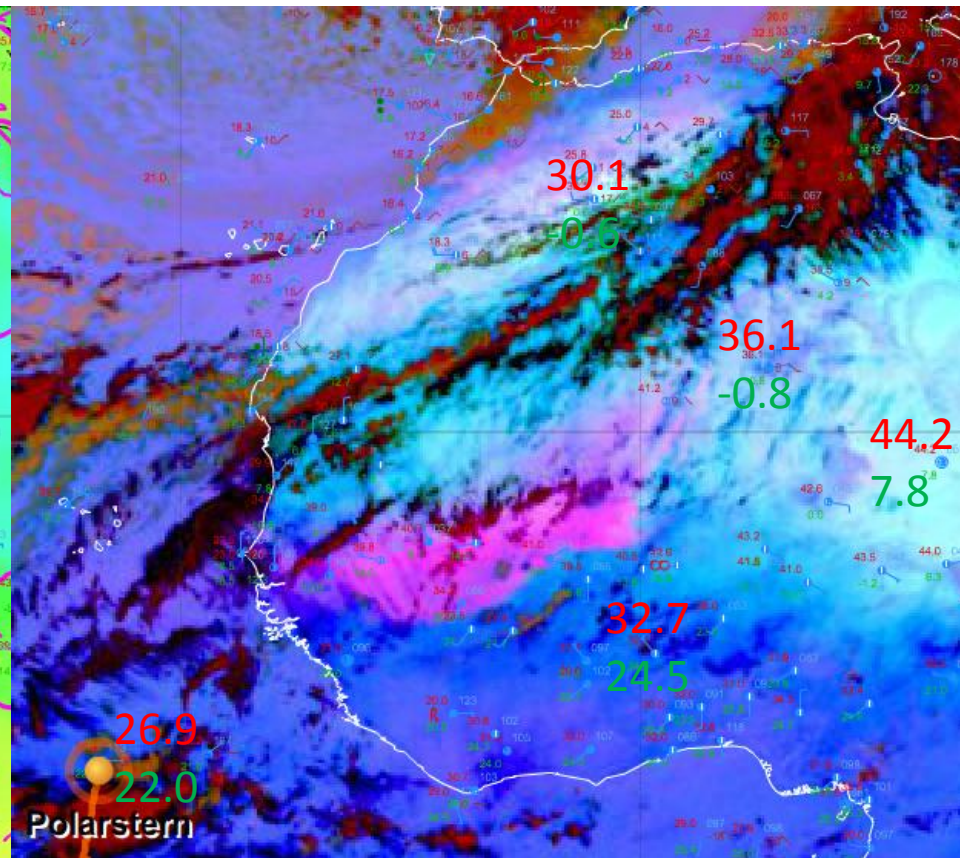
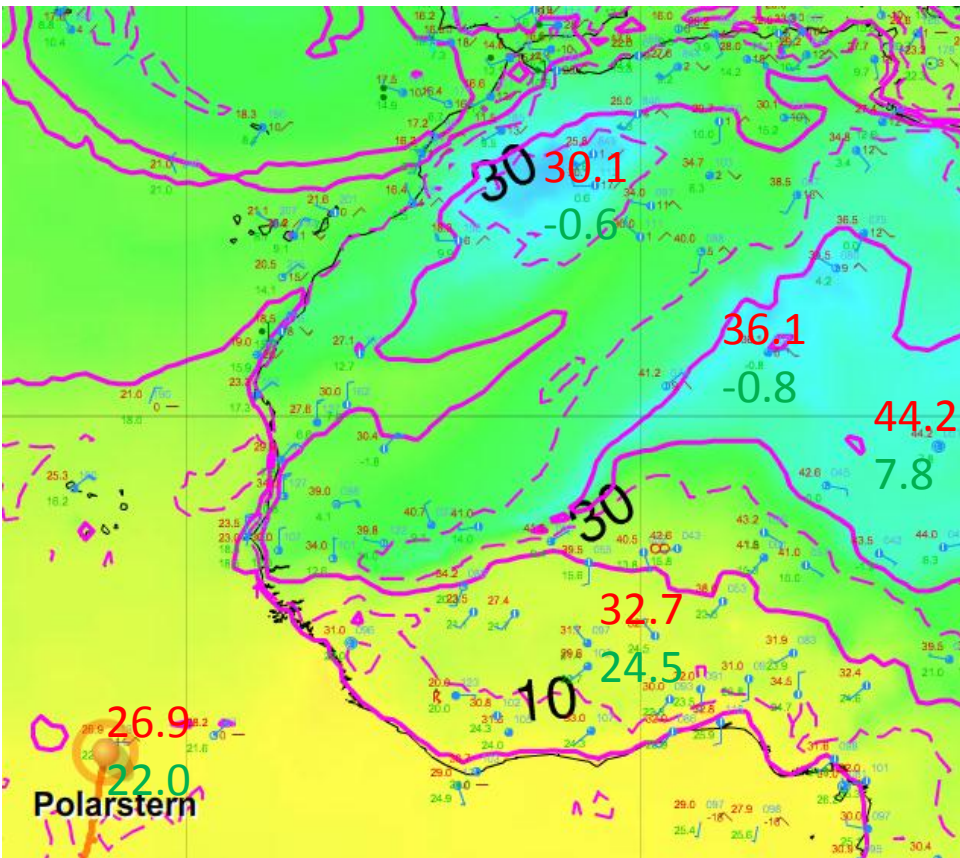
Dewpoint Temperature [$^{\circ}\text{C}$]



Dewpoint
Depression [K]

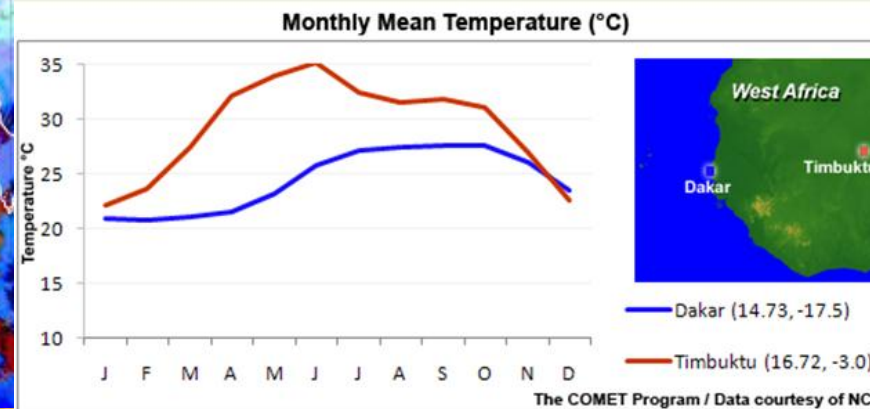
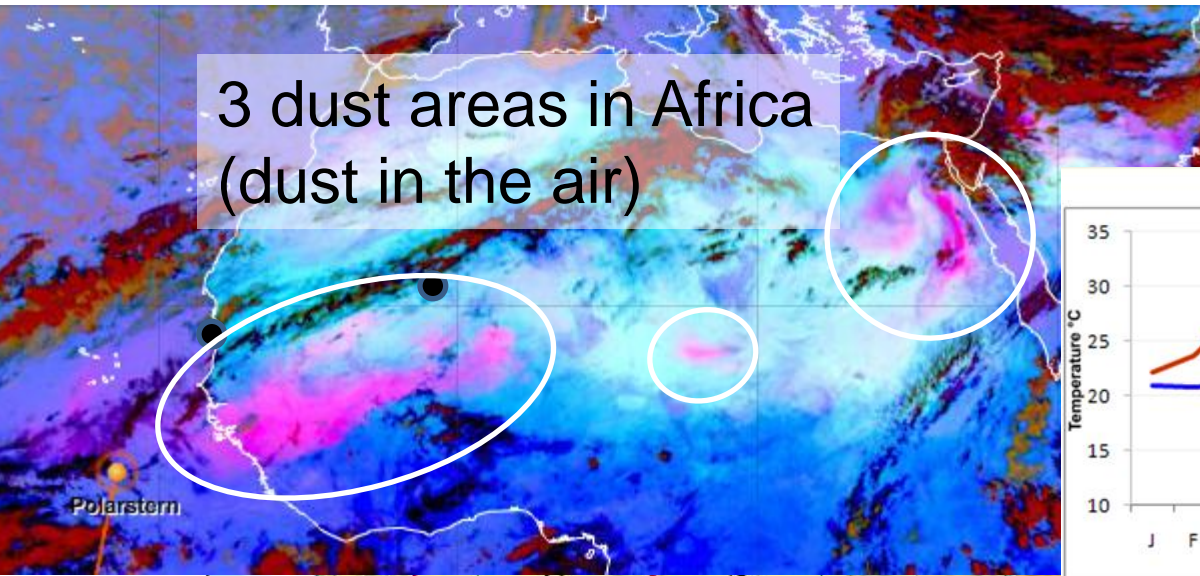


Dust RGB

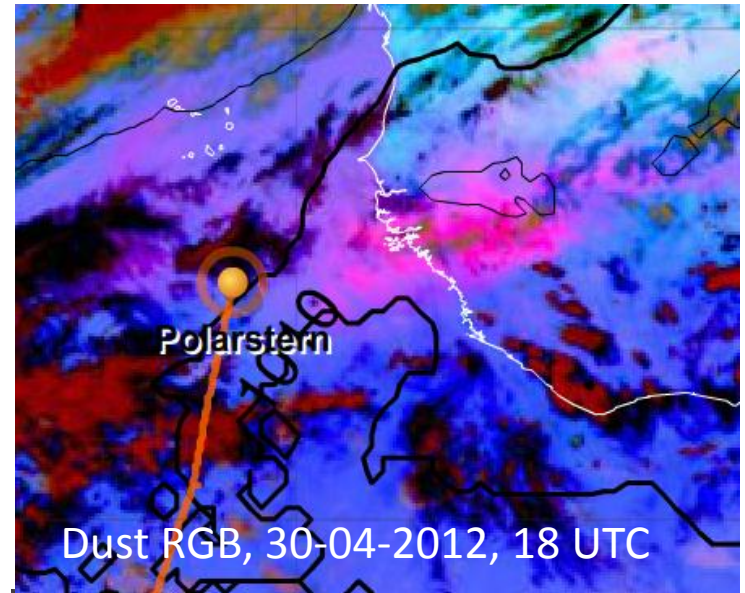
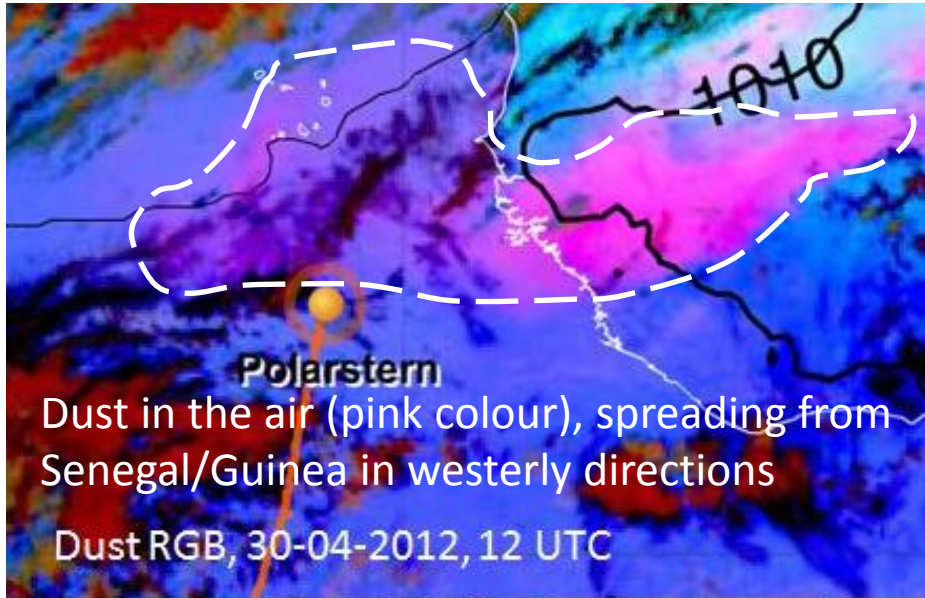


3 dust areas in Africa
(dust in the air)

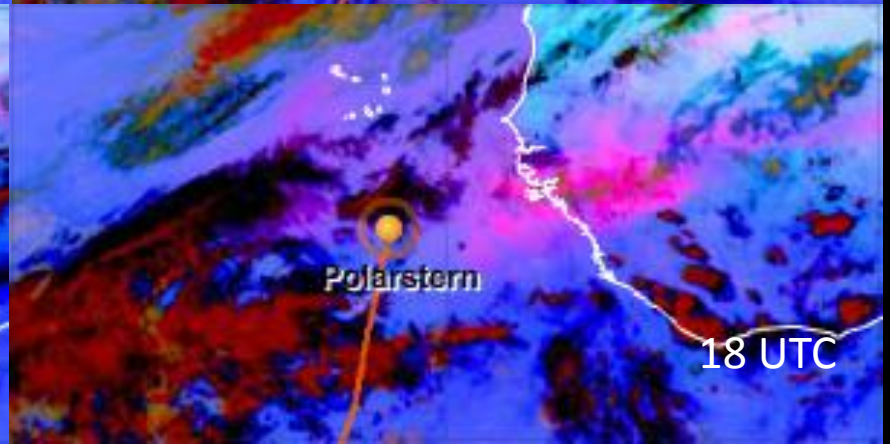
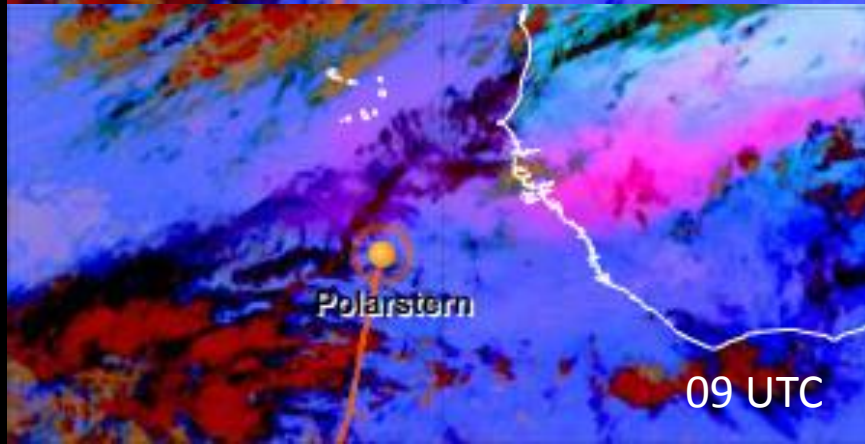
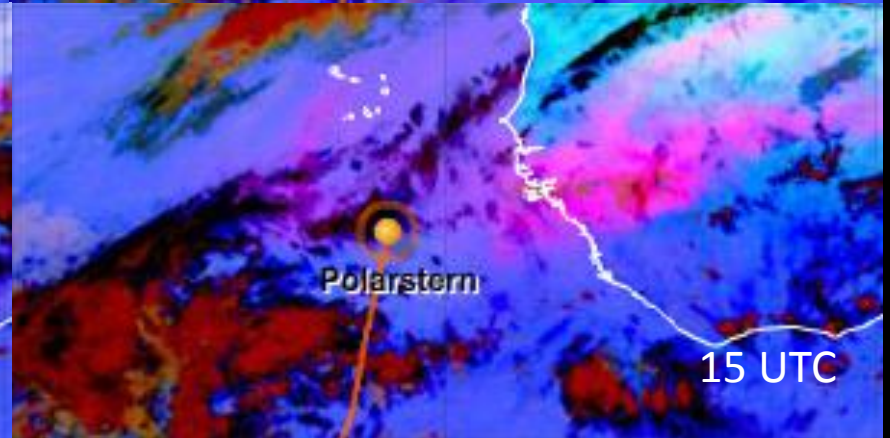
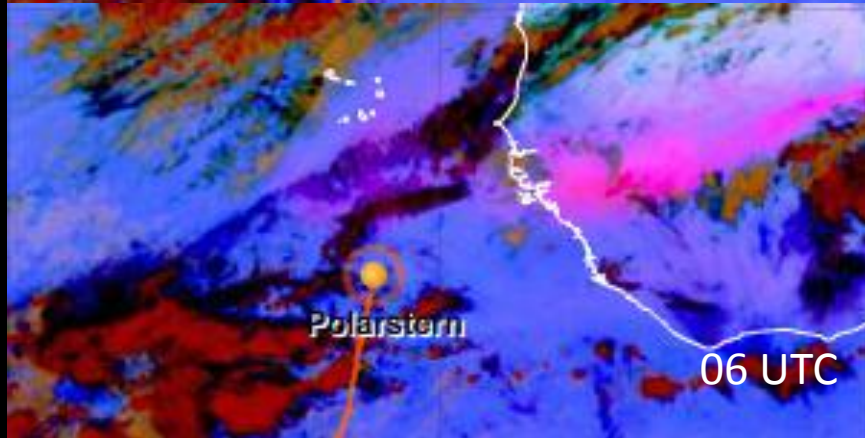
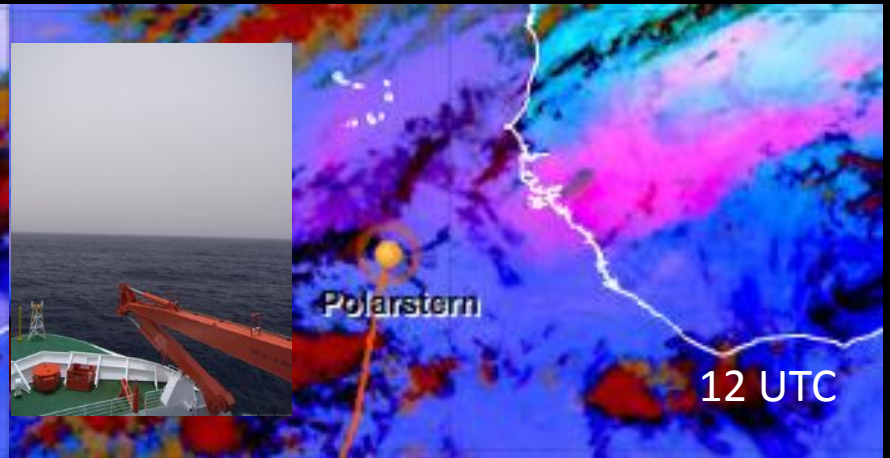
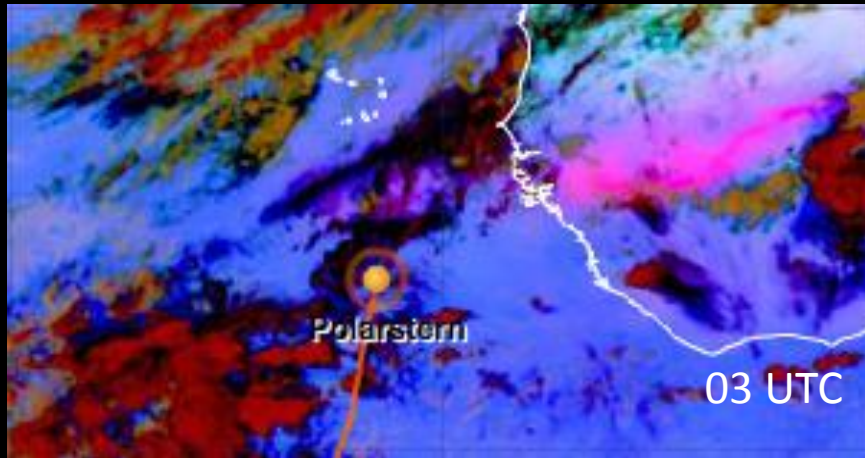
30-04-2012, 12 UTC
Dust RGB



30-04-2012, 12 UTC



Dust RGB, 30-04-2012, 03 UTC – 18 UTC

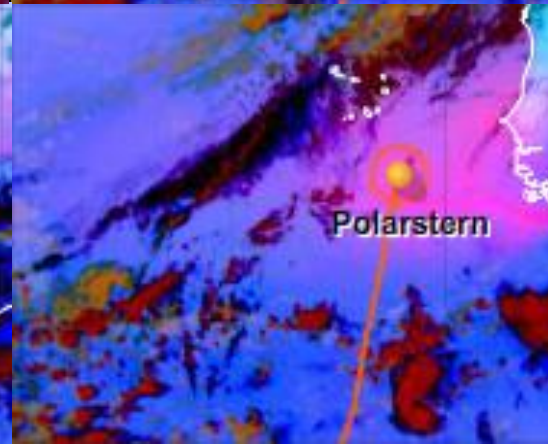
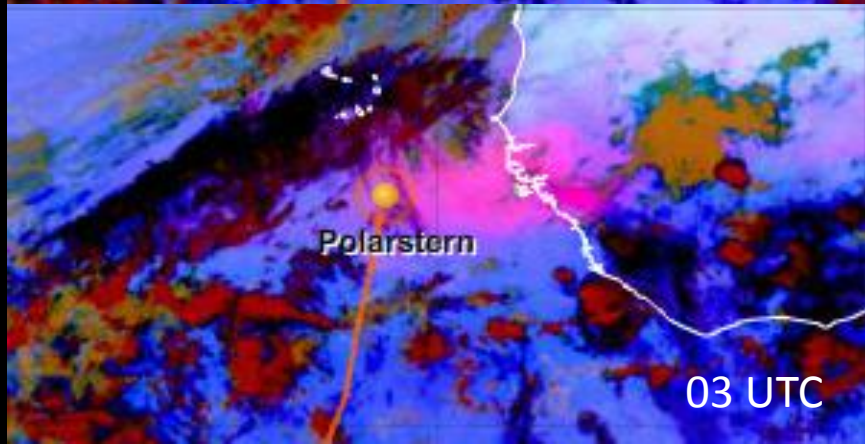
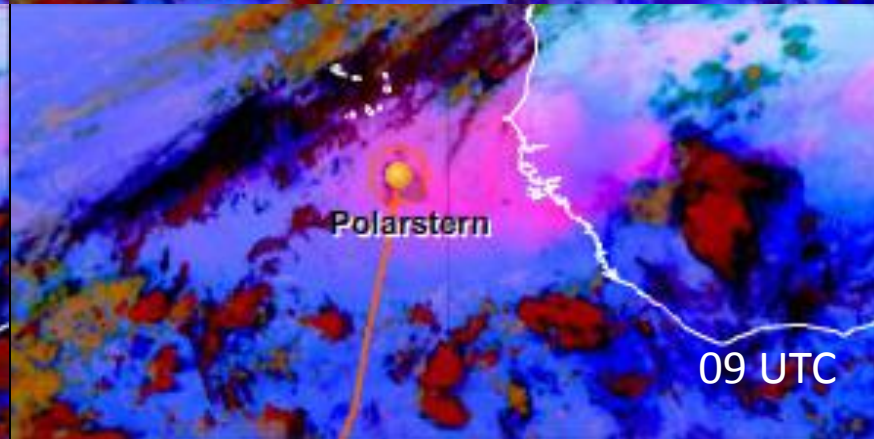
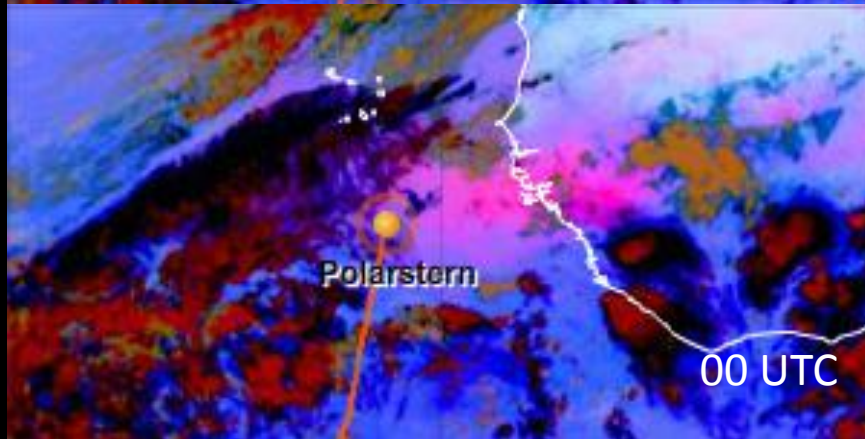
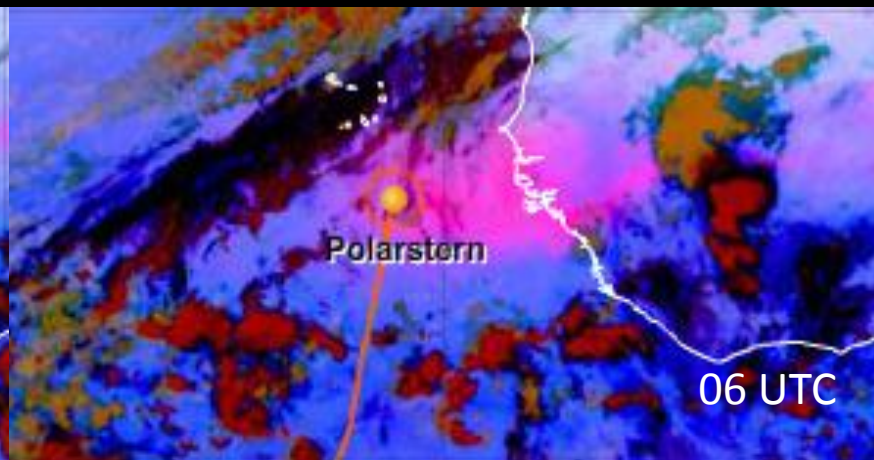
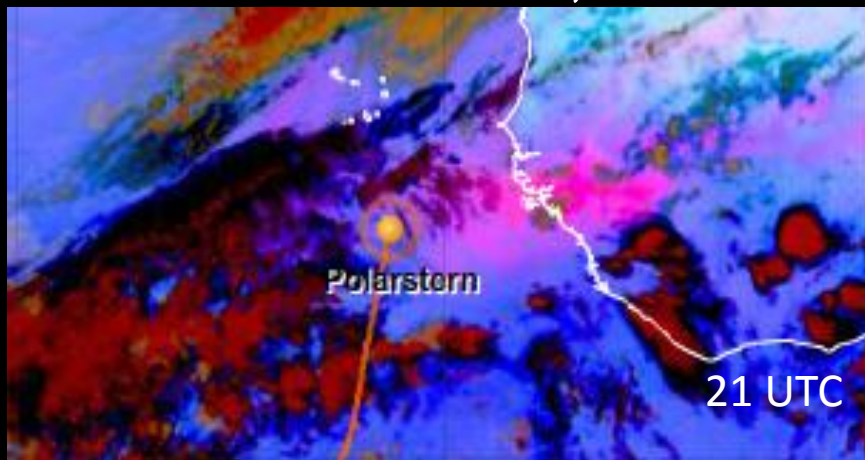


30-04-2012

The dust is falling out without shower, deposits on the staff



Dust RGB, 30-04 21 UTC – 01-05 12 UTC





Ask yourself:
What means the
red character?

01-05-2012

DBLK 01121 99124 70222 41/**96** 90210
10233 20189 40141 58001
70900 89///
22282 04229 20301 335//
40904 =



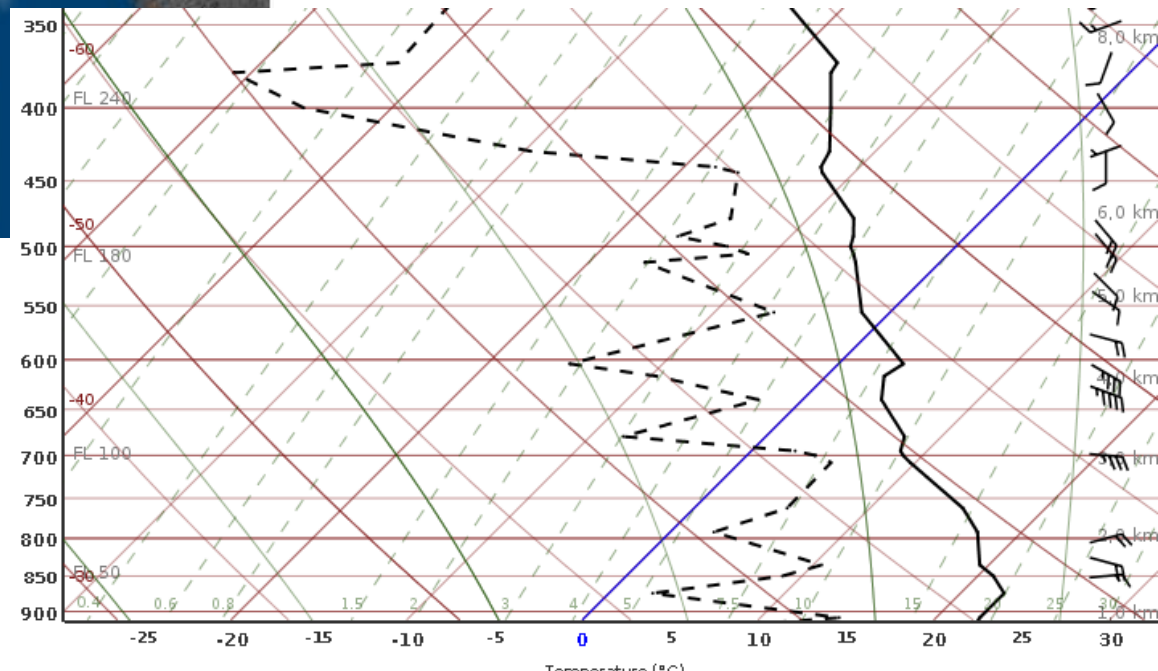
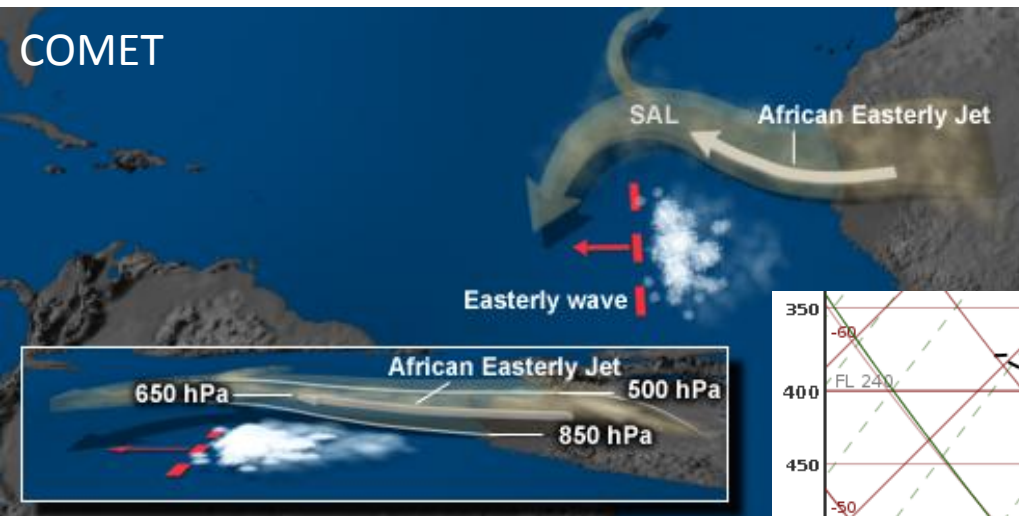
Dust or sand storm
4 km visibility

01-05-2012

DBLK 01121 99124 70222 41/96 90210
10233 20189 40141 58001
70900 89/// 22282 04229 20301 335//
40904 =

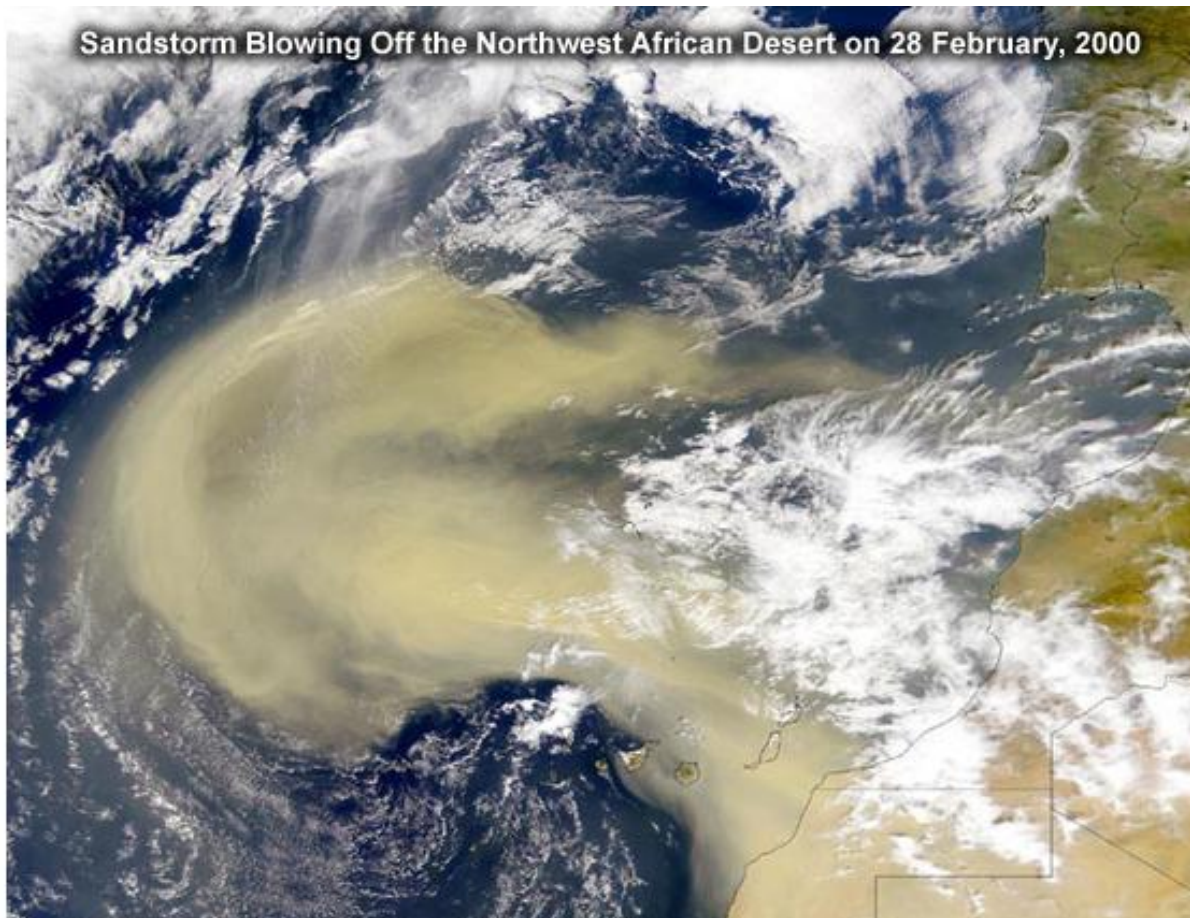
Conceptual model of Saharan Air Layer (SAL)

- 1500 – 6000 m with large amounts of mineral dust
- Dry air and strong winds (10-25 m/s)
- African Easterly Jet with wind speeds maximize at about 650 hPa



Conceptual model of Saharan Air Layer (SAL)

- Most over the Sahara Dessert during late spring, summer
- Usually it moves west over the tropical Atlantic
- The image shows a winter dust storm, moving west from Africa



**Thank you Juliane Hempelt and Max Miller
for more than 60 E-Mails and information.**

Have a good remaining trip to Bremerhaven

Peter Schmitt, DWD-Langen