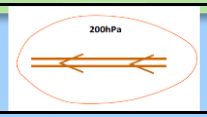
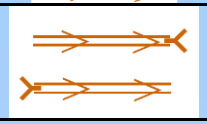
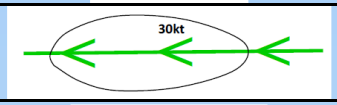
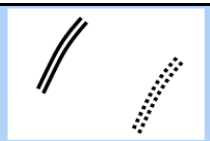
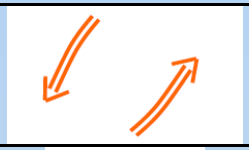
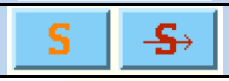
	**TEJ** (Tropical Easterly Jet) axis the core must be outlined with an indication of the considered level 200 or 100 hPa
	**STJ** (Subtropical Jet) or **PJ** (Polar Jet) axis
	Exit / Entrance of a Jet
	**UTT** (Upper Tropospheric Trough)
	**Potential Vorticity (PV) Anomaly** active / not active
	Cold and Warm surface Front
	**Mid-level Dry Intrusion** boundary
	**AEJ** Axis the core must be outlined with an indication of the threshold (25 or 30 kt)
	**AEW Trough** **AEW Ridge**
C850	**Cyclonic vortex** at a specific level - here 850 hPa (or layer)
A and D	**Surface high (Anticyclone "A") and low (Depression "D") pressure centres (alternatively, in anglophone usage, "H" and "L")**
	Northerly **Dry Burst** Southerly **Monsoon Burst**
	**MT** (Monsoon Trough) at 850 hPa
	**ITCZ** (Inter-tropical Convergence Zone) over ocean active / not active for convection
	**Dust or Sand** symbols (see Table 5.2.1)
	**Convection** and growing or decaying stages NB: Organized convective system can be outlines and shaded in red

Table 11.1: List of symbols figuring on the WASA-F maps. Caution: some symbols may evolve or depend on the weather analysis and forecasting system used: here they are illustrated for the "Synergie" system developed by Météo-France and Meteo France International.

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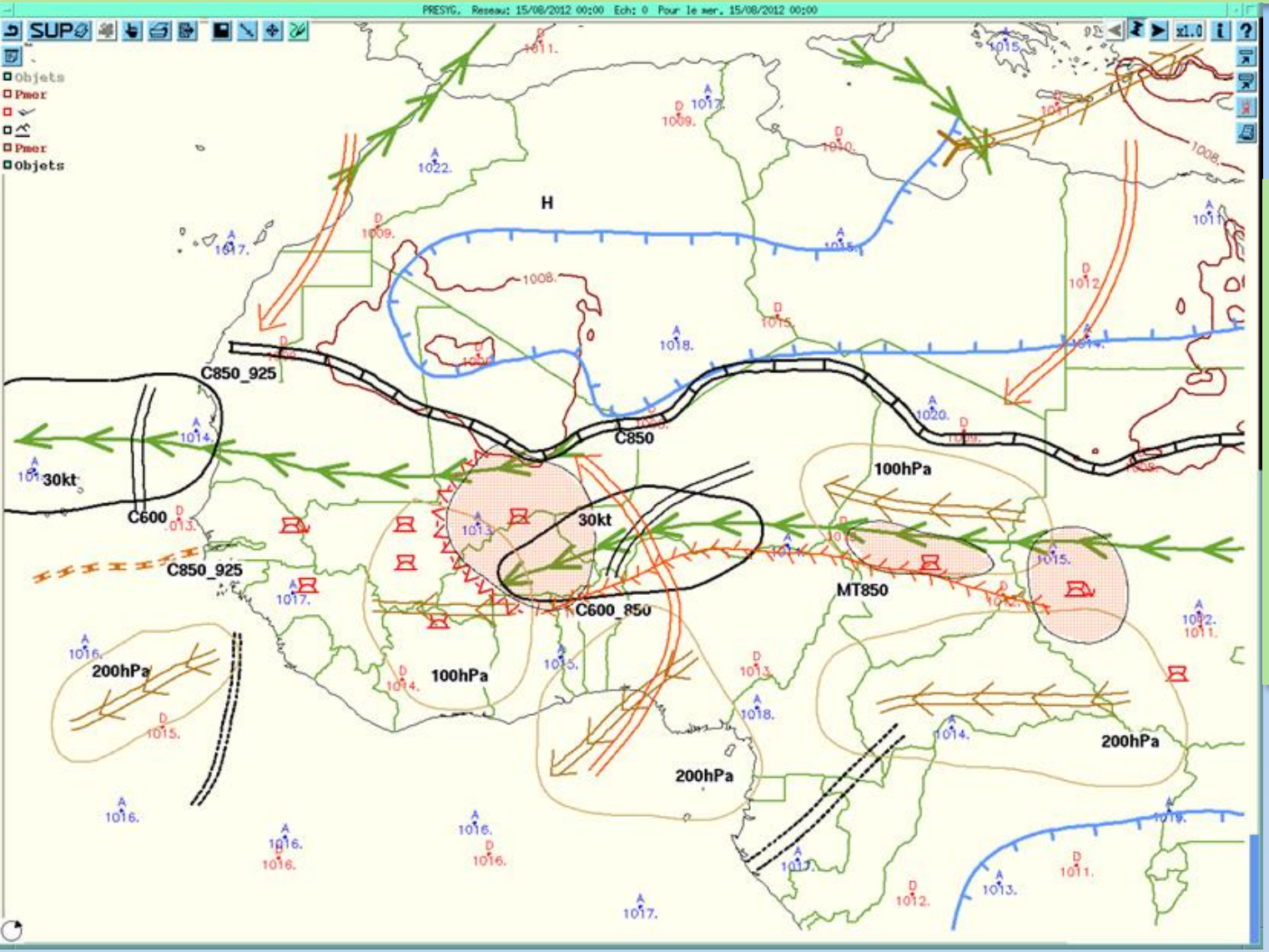

Figure 11.1: Illustration of the different key features figuring on a WASA/F, for 15 August 2012 at 0000 UTC.
Figure produced with the "Synergie" system developed by Météo-France and Meteo France International

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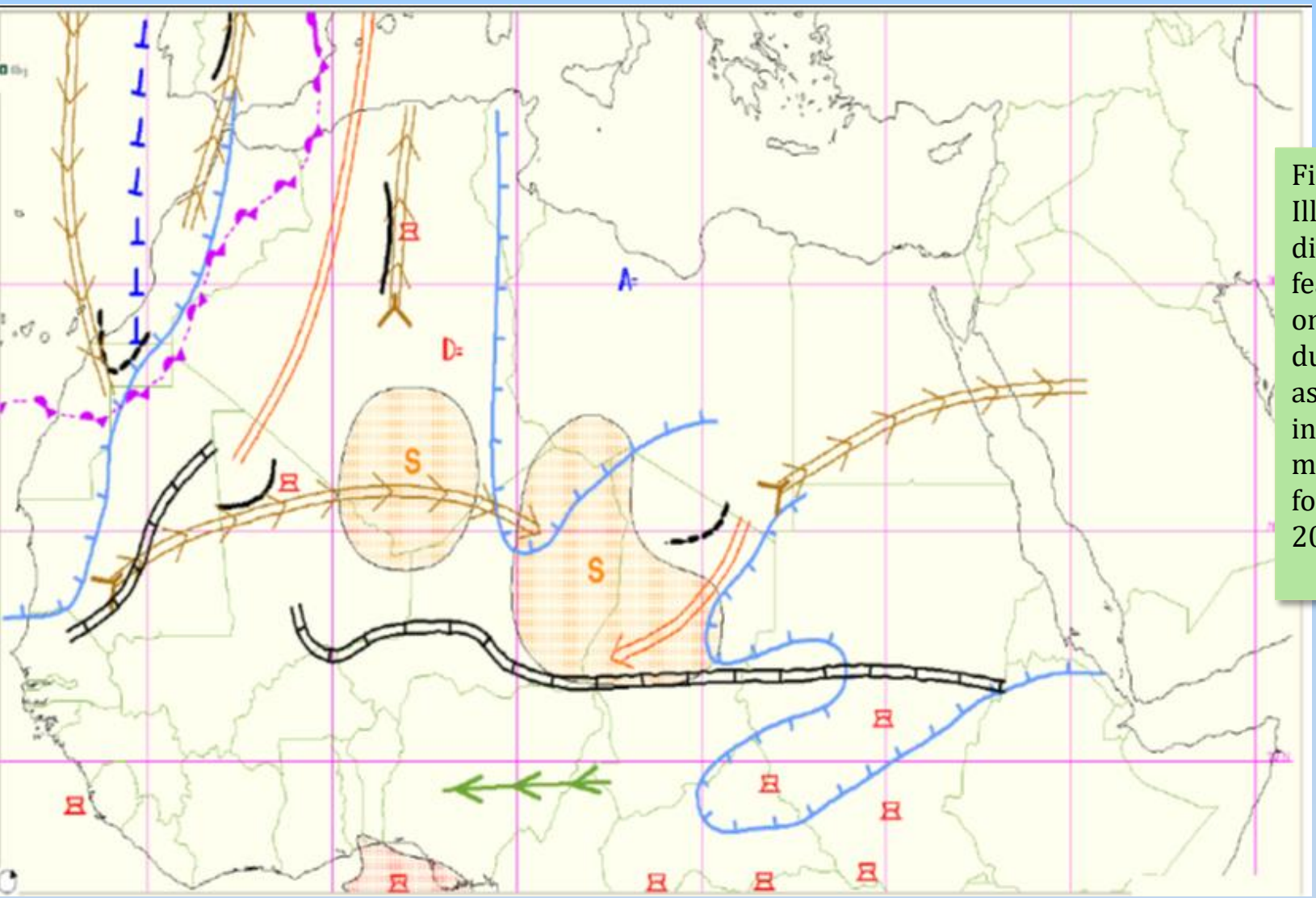

Figure 11.2: Illustration of the different key features figuring on a WASA/F, for a dust situation associated with an interaction with midlatitudes; here for 19 October 2012 at 1200 UTC.

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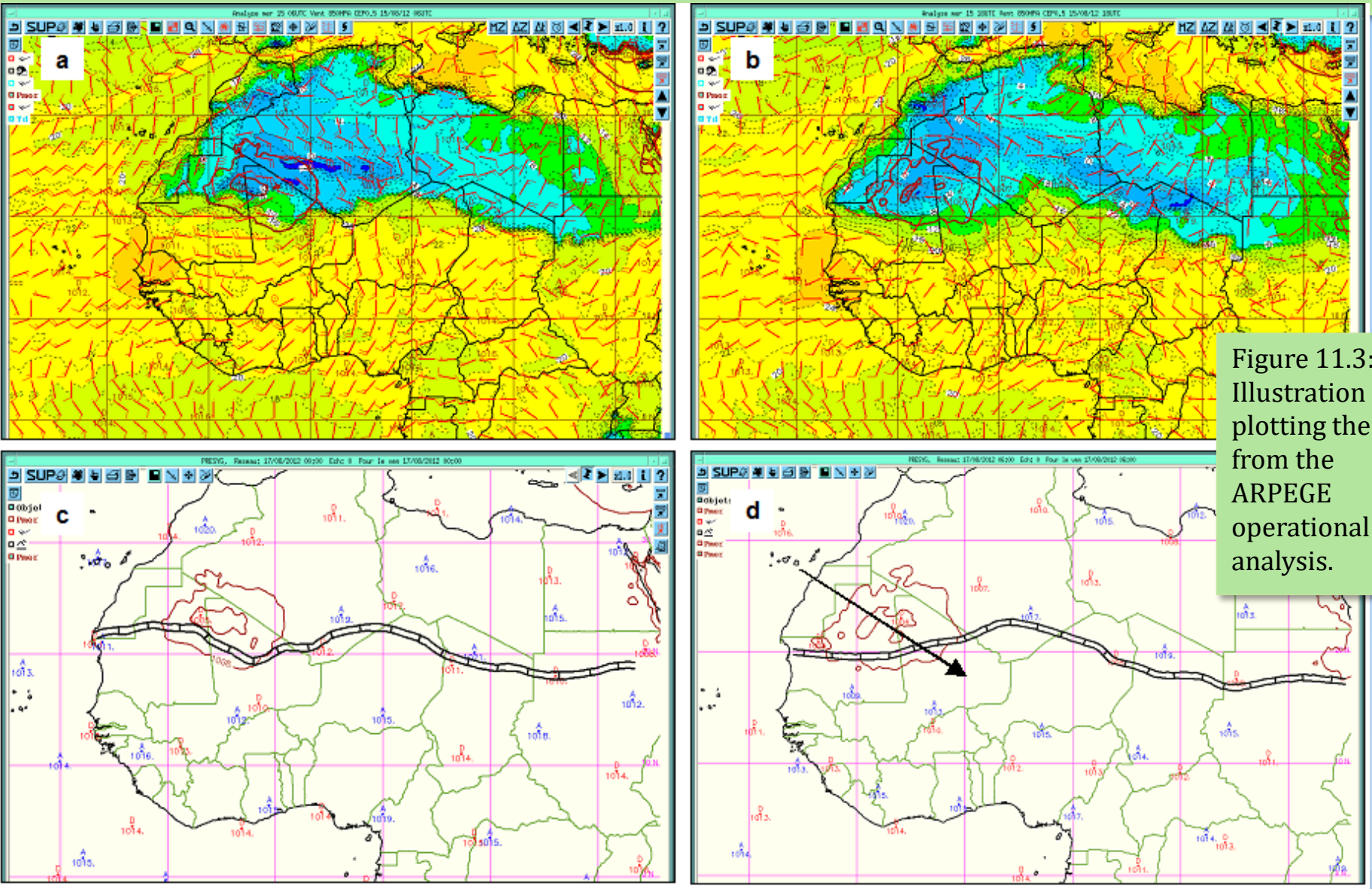

Figure 11.3: Illustration of plotting the ITD from the ARPEGE operational analysis.

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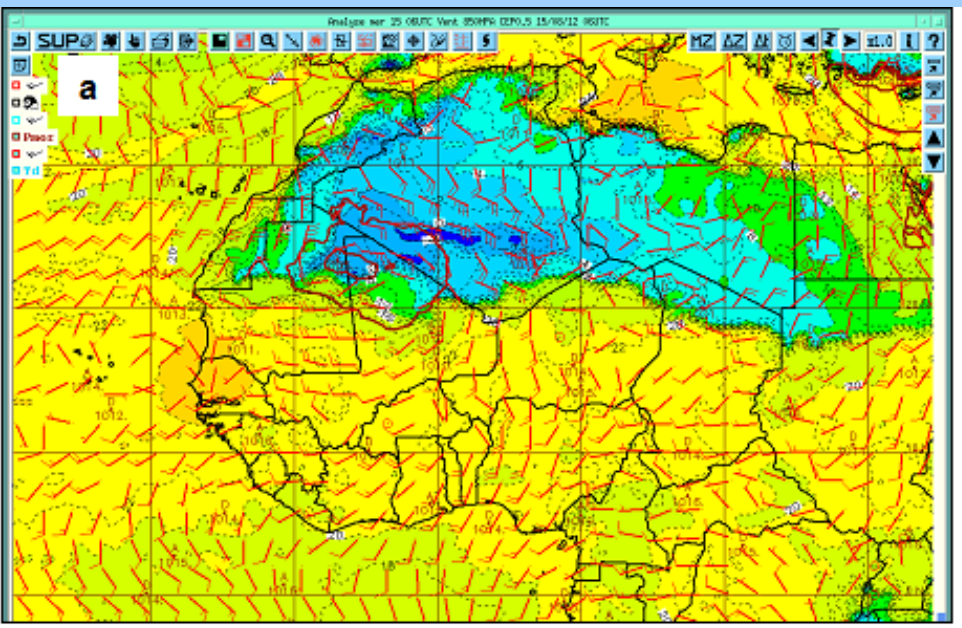

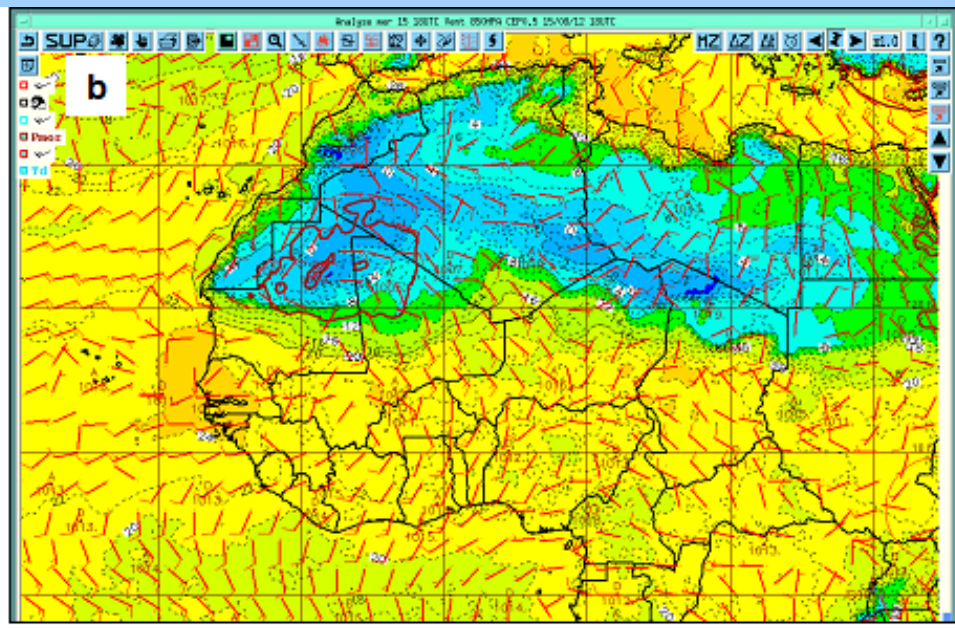

Figure 11.3: Illustration of plotting the ITD from the ARPEGE operational analysis. Maps of Td at 2 m (colour), horizontal wind vectors at 925 hPa and MSLP field (2 hPa isoline interval), to outline the Heat Low (threshold of 1008 hPa and 1006 hPa at 0600 UTC (a) and 1800 UTC (b) respectively) for 15 August 2012.

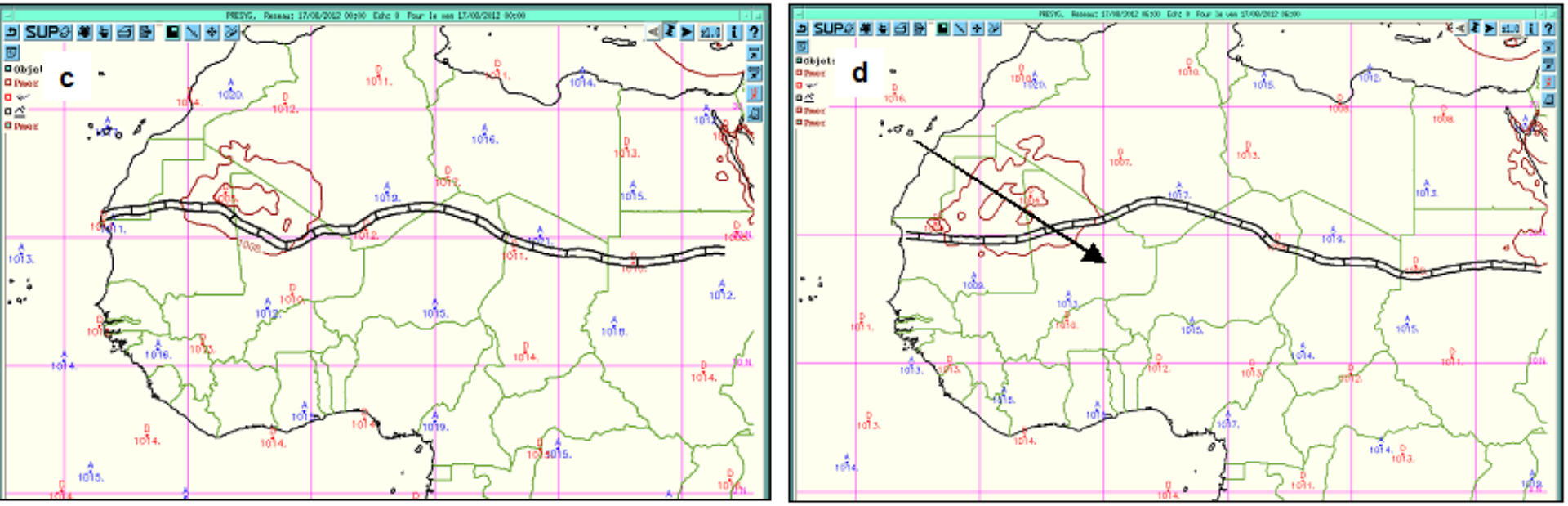

Figure 11.3: Illustration of plotting the ITD from the ARPEGE operational analysis. (c and d): corresponding WASA for the ITD and HL features. The arrow on Figure 11.3d indicates the location of the vertical cross-section displayed by Figure 11.6.

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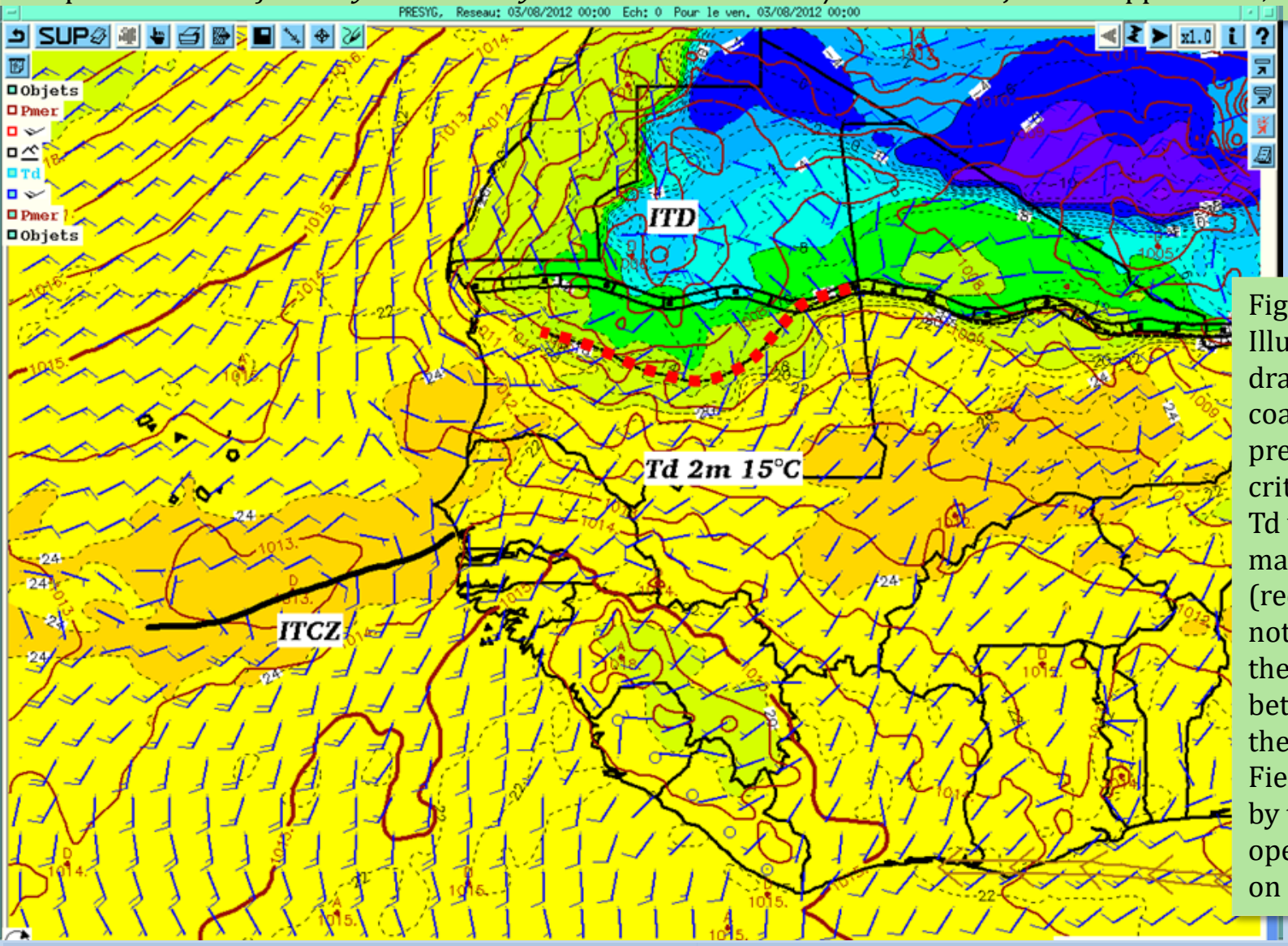

Figure 11.4: Illustration of ITD drawing near the coast, using the pressure and wind criteria, where the Td value (15°C) and maximum gradient (red dotted line) are not coincident. Note the discontinuity between the ITD and the ITCZ over ocean. Fields are provided by the ARPEGE operational analysis on 3rd August 2012.

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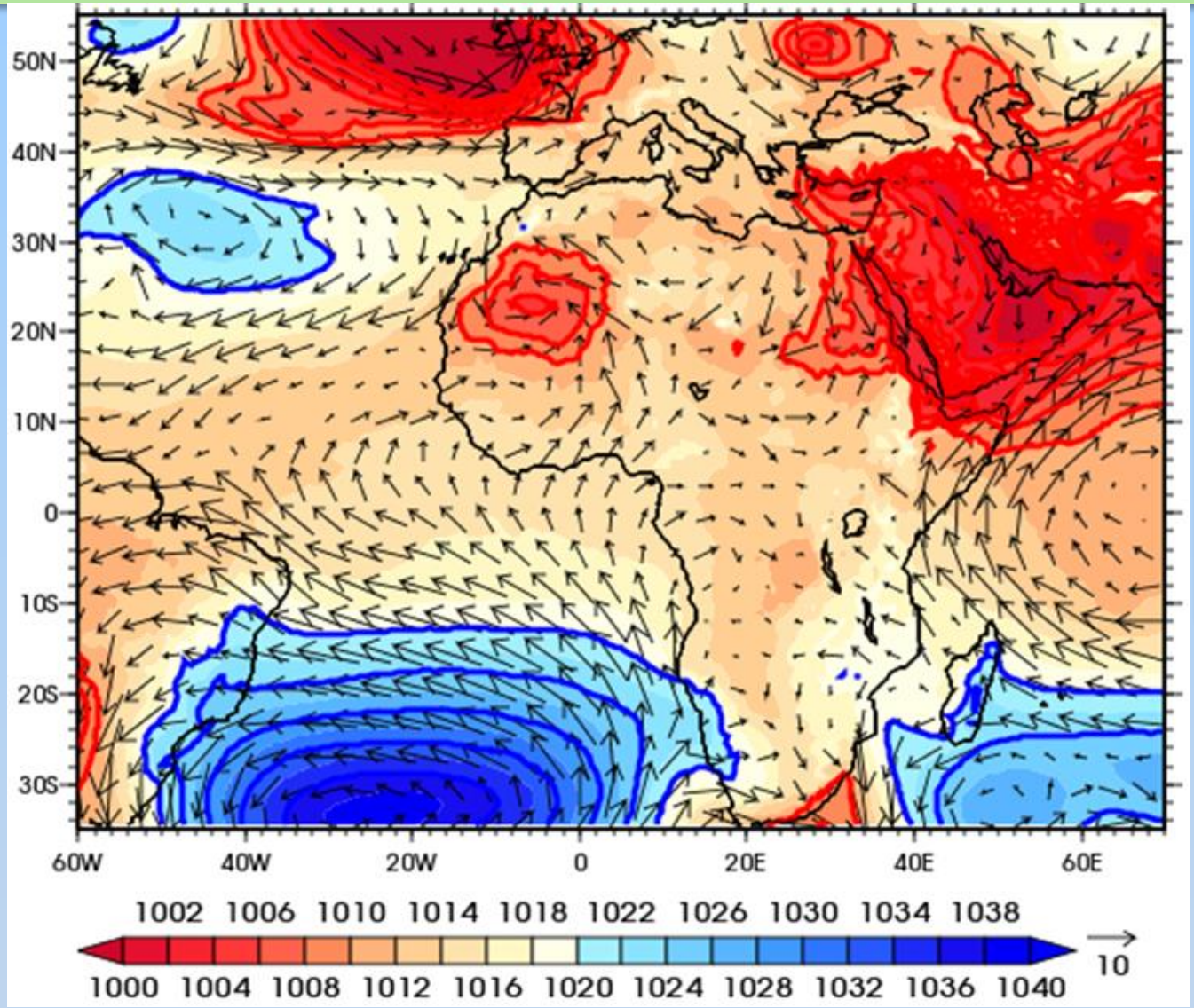

Figure 11.5: Daily-average of MSL pressure field and wind at 925 hPa for the 15th August 2012, as available on the MISVA site for the ECMWF operational analysis. Red and blue areas correspond to low and high pressure centres respectively.

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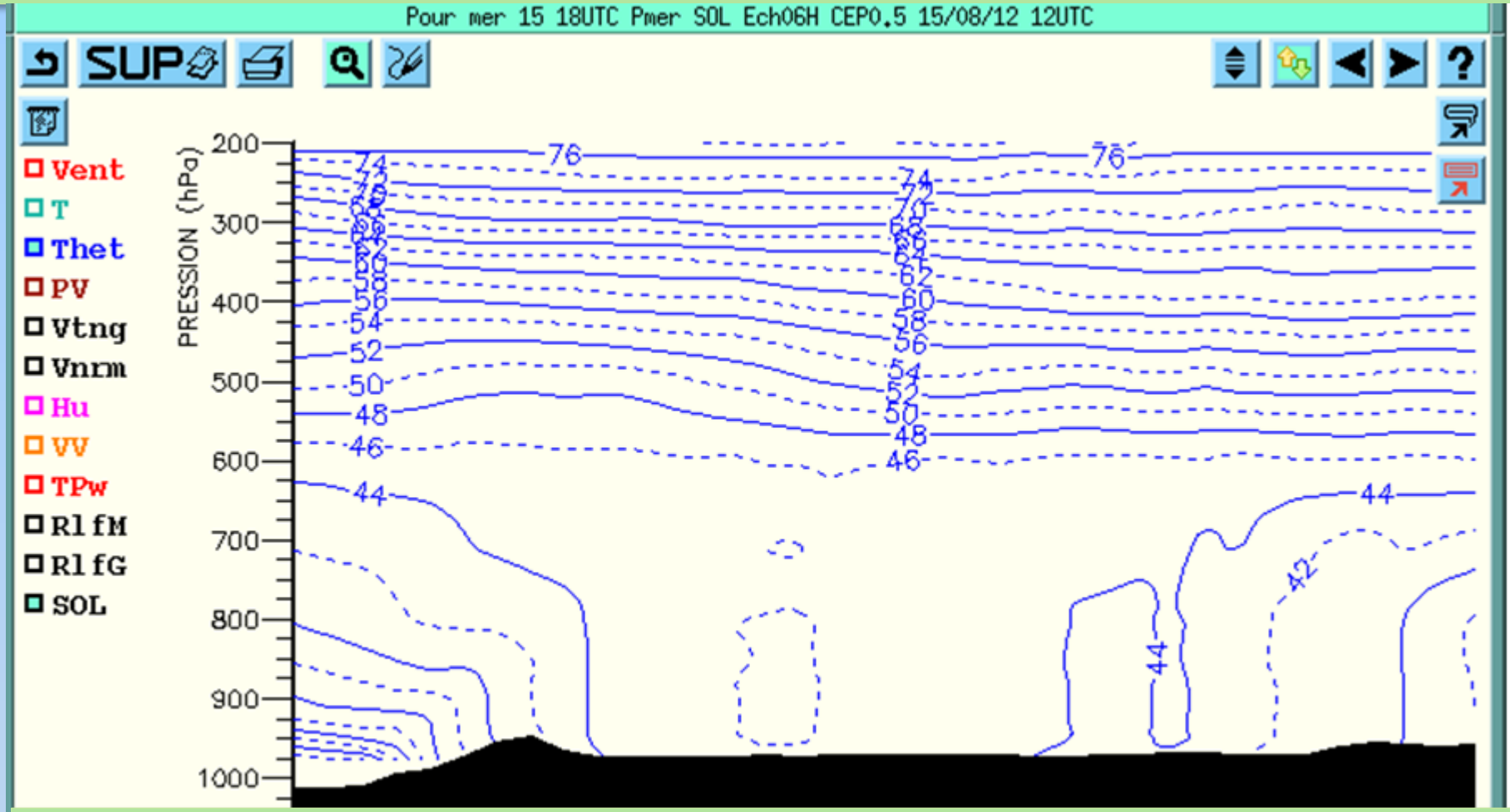

Fig. 11.6: Vertical cross-section of potential temperature θ, of the HL for 15 August 2012 at 1800 UTC, along the arrow drawn on Fig. 11.3 from [28°N; 15°W] to [18°N;1°E]. The warm boundary-layer air associated with the HL extends vertically up to around 600 hPa in this case

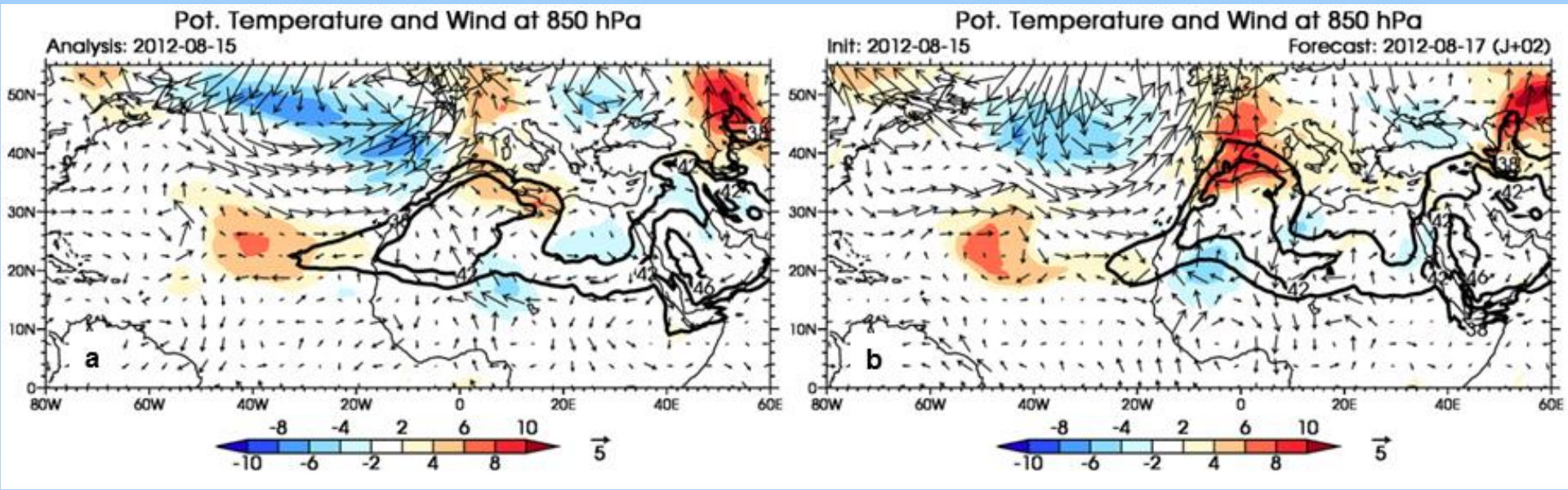

Fig. 11.7: Daily mean maps of 850-hPa potential temperature θ (colours / K) and wind anomalies (arrows, ms^{-1}) for (a) the ECMWF analysis of 15 August 2012 and (b) the 2 days-range forecast valid on 17 August 2012. Contours indicate the raw 850-hPa θ (in °C) with one contour every 4°C, from 38°C to outline the HL area. All anomalies are determined against a climatological daily seasonal cycle, computed with ERA-Interim. 6-hourly ECMWF data were averaged to obtain daily data. Maps available from the MISVA site.

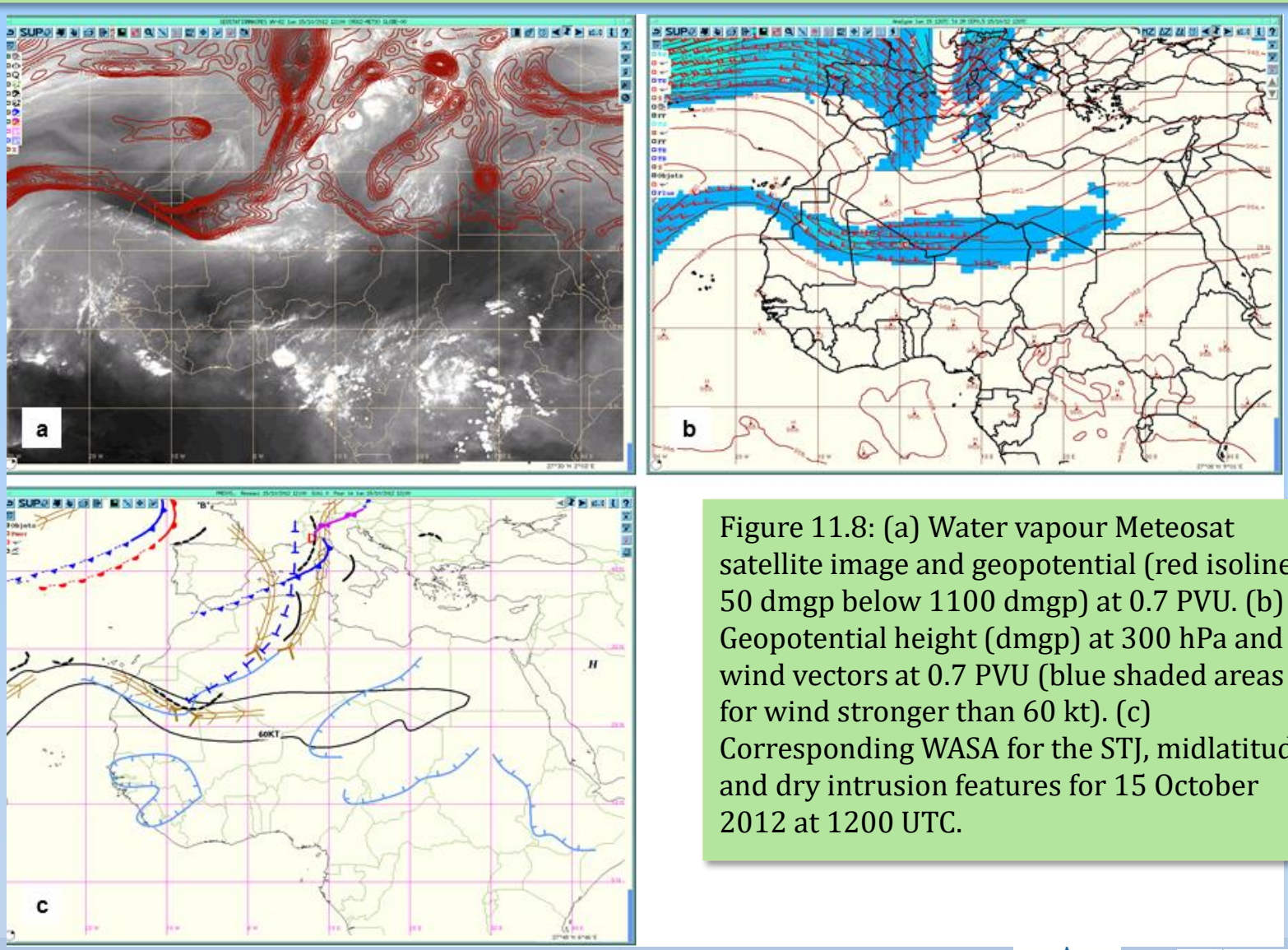

Figure 11.8: (a) Water vapour Meteosat satellite image and geopotential (red isolines: 50 dmgp below 1100 dmgp) at 0.7 PVU. (b) Geopotential height (dmgp) at 300 hPa and wind vectors at 0.7 PVU (blue shaded areas for wind stronger than 60 kt). (c) Corresponding WASA for the STJ, midlatitude and dry intrusion features for 15 October 2012 at 1200 UTC.

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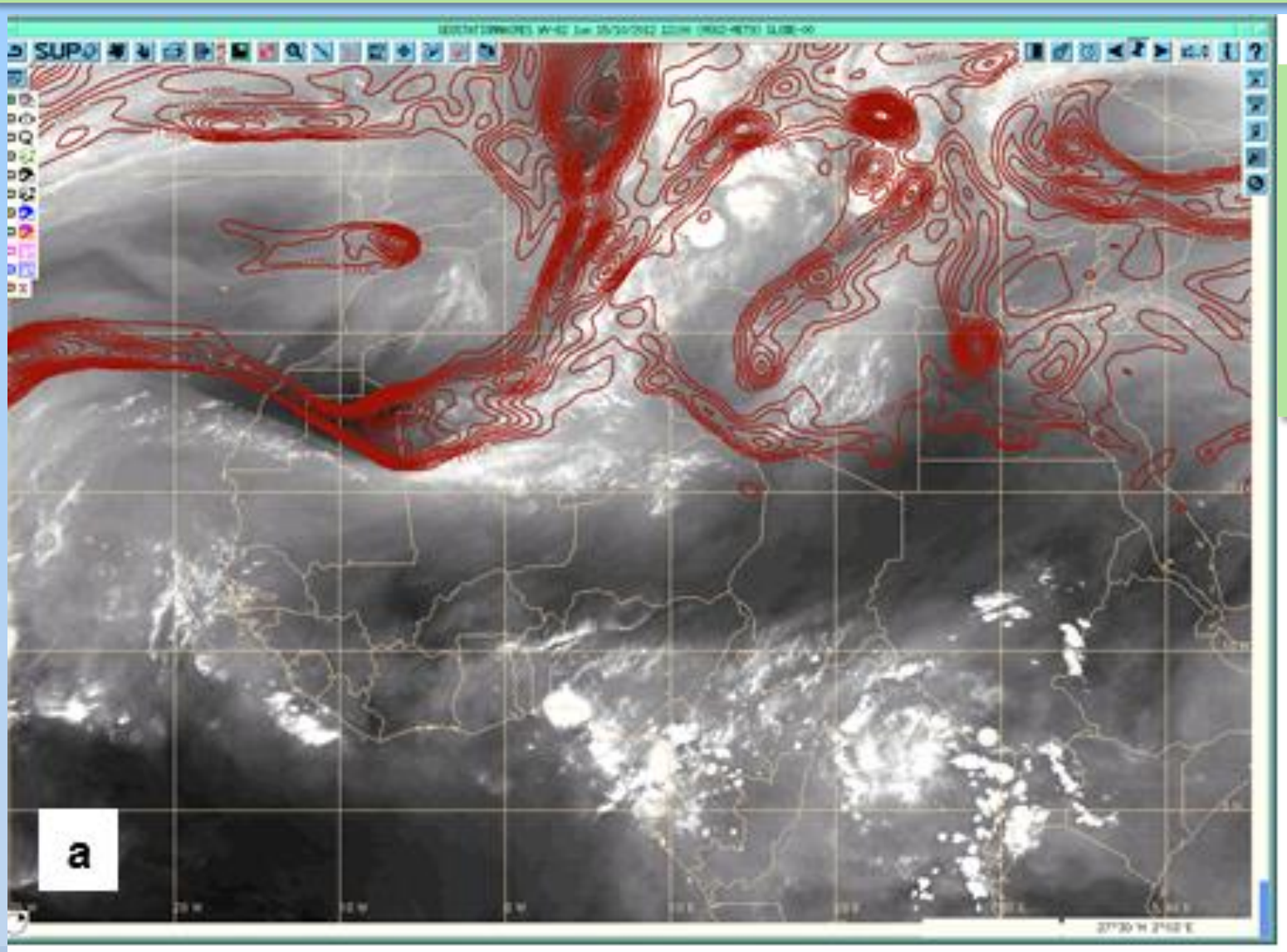


Figure 11.8: (a) Water vapour Meteosat satellite image and geopotential (red isolines: 50 dmgp below 1100 dmgp) at 0.7 PVU.

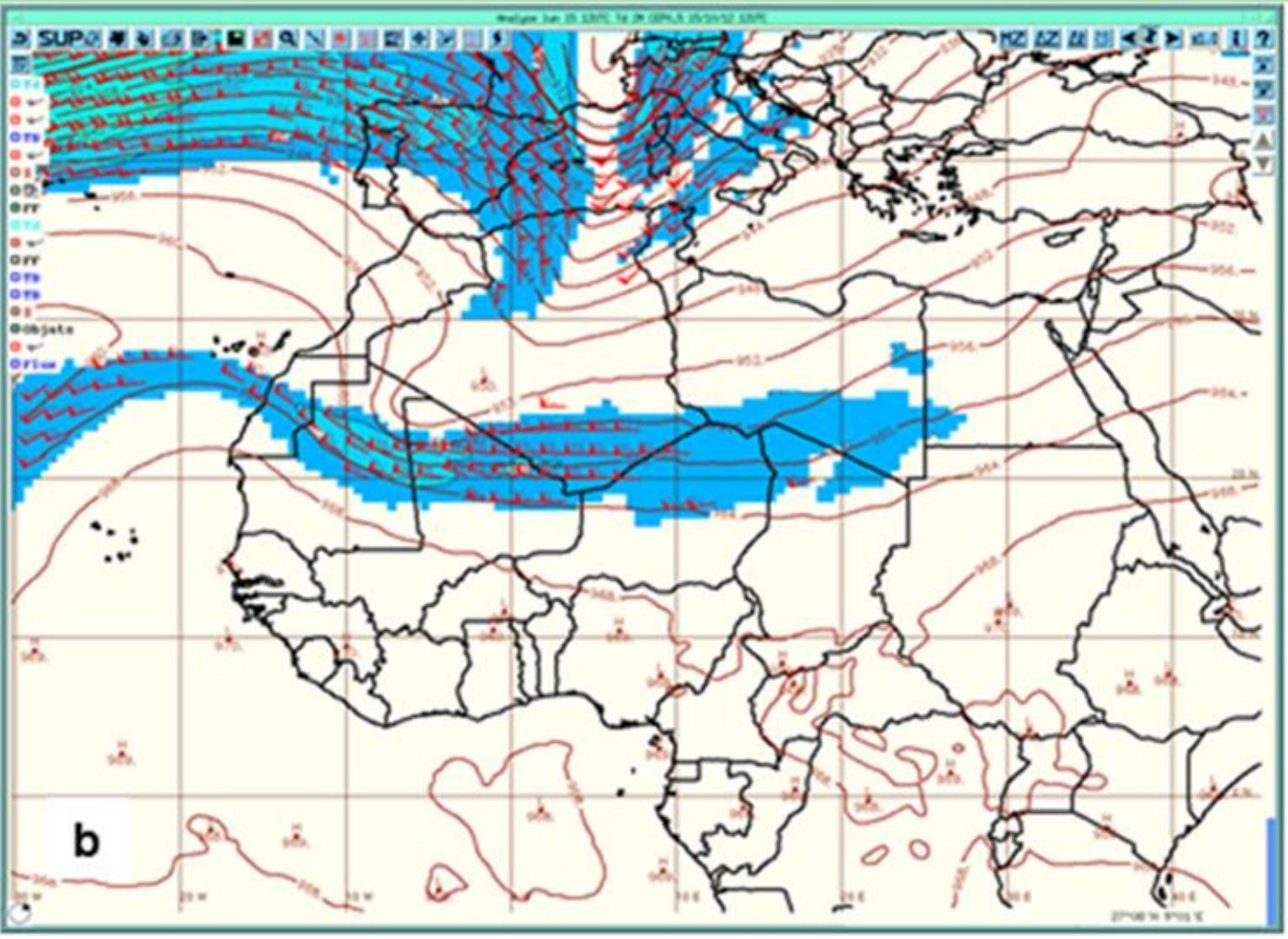


Figure 11.8: (b) Geopotential height (dmgp) at 300 hPa and wind vectors at 0.7 PVU (blue shaded areas for wind stronger than 60 kt).

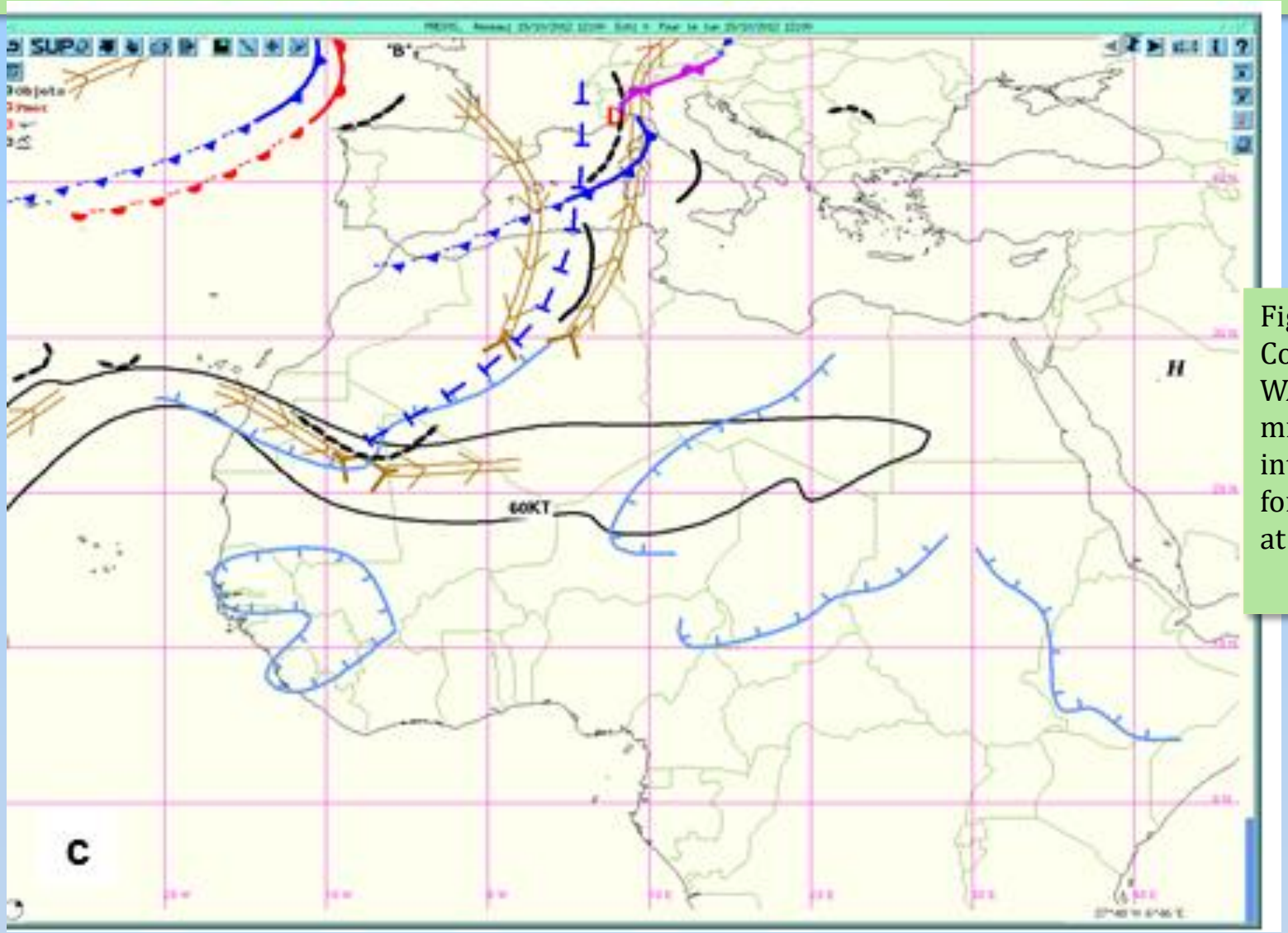
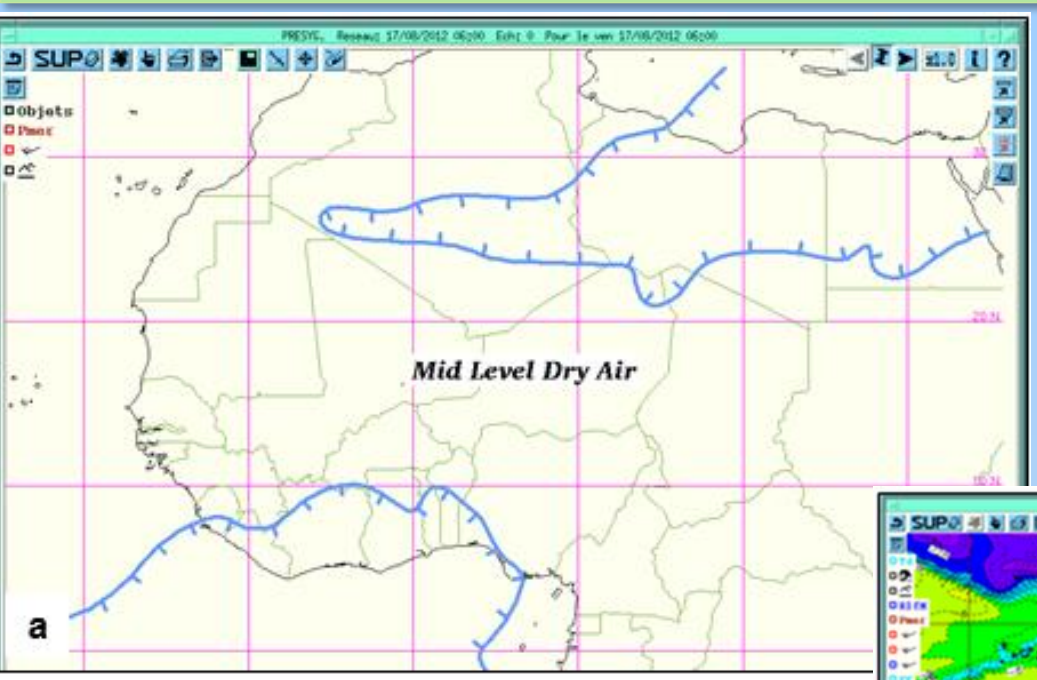


Figure 11.8: (c) Corresponding WASA for the STJ, midlatitude and dry intrusion features for 15 October 2012 at 1200 UTC.



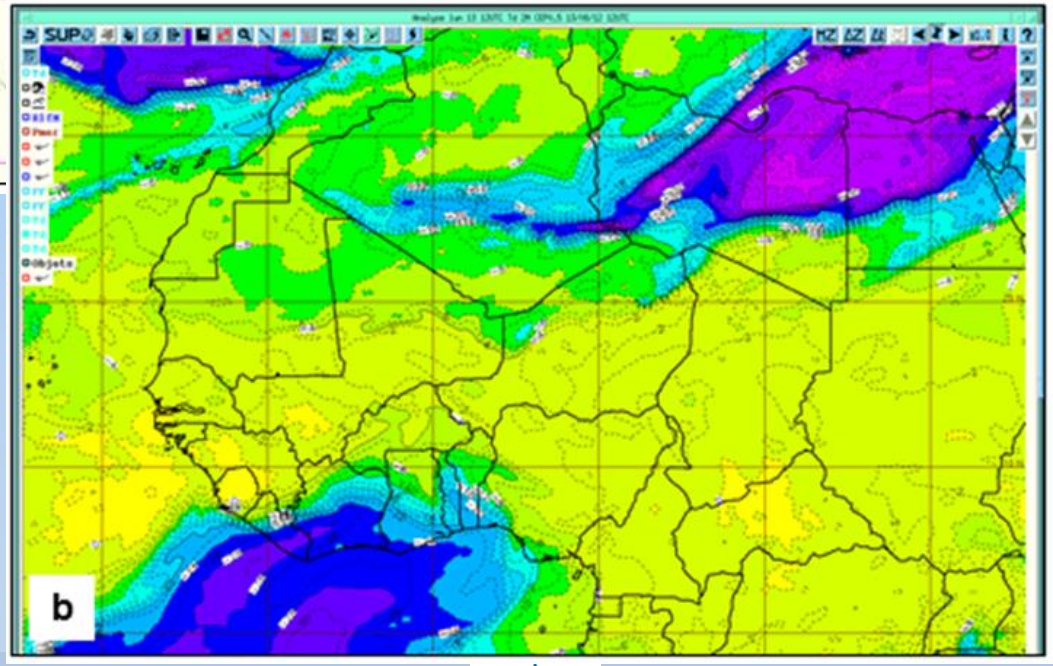


Fig. 11.9: Drawing of mid-level dry air (a) using the Td map at 600 hPa (b) provided by the ARPEGE operational analysis for 13 August 2012 at 1200 UTC.

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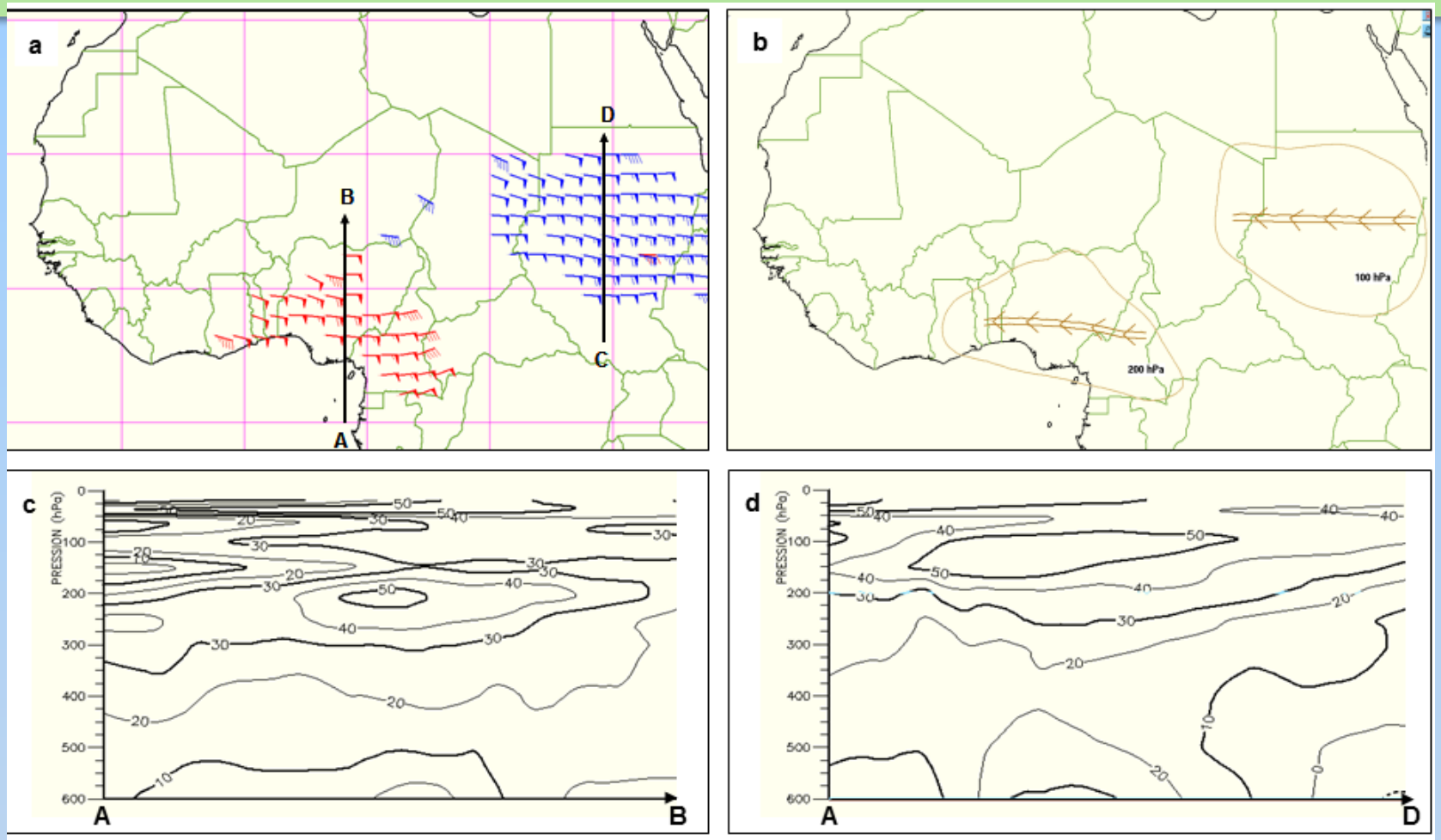
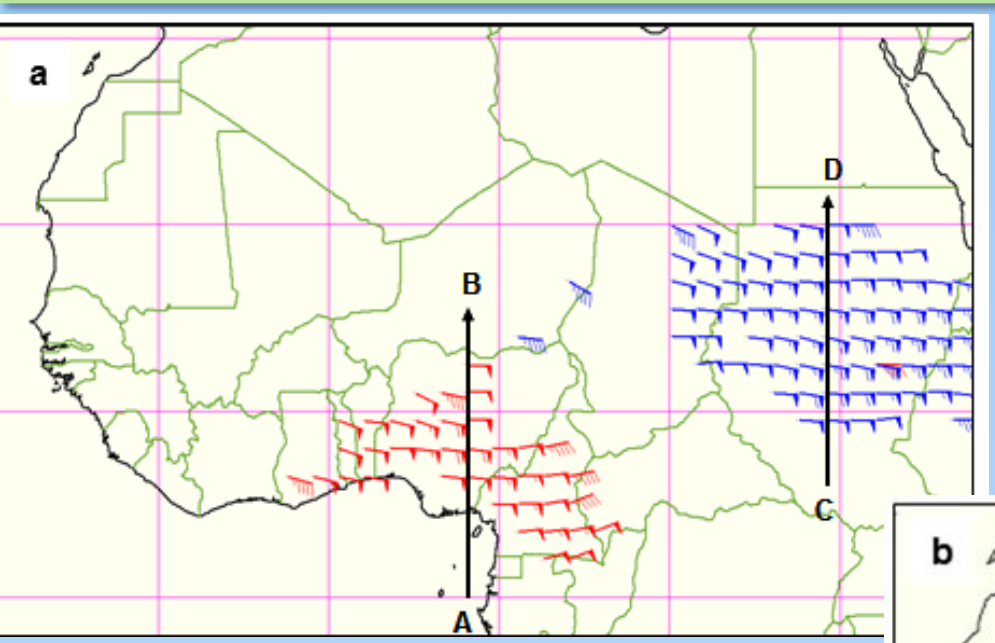


Figure 11.10: Illustration of TEJ drawing for 13 August 2012 at 1200 UTC (a) Wind vector (kt) at 200 hPa (threshold 45 kt) in red, and at 100 hPa (threshold 45 kt) in blue. (b) Resulting WASA for the TEJ drawing, (c, d) Vertical South-North cross-sections of the zonal wind intensity along the segments AB and CD respectively, indicated on Panel (a). Fields are provided by ARPEGE operational analysis.



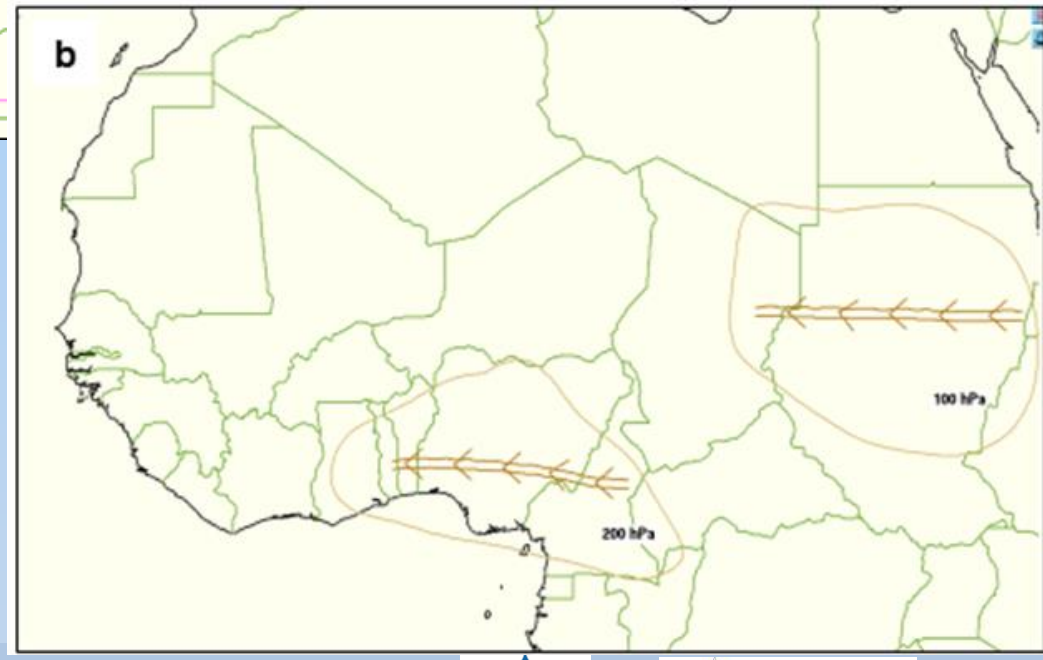


Figure 11.10: Illustration of TEJ drawing for 13 August 2012 at 1200 UTC (a) Wind vector (kt) at 200 hPa (threshold 45 kt) in red, and at 100 hPa (threshold 45 kt) in blue. (b) Resulting WASA for the TEJ drawing.

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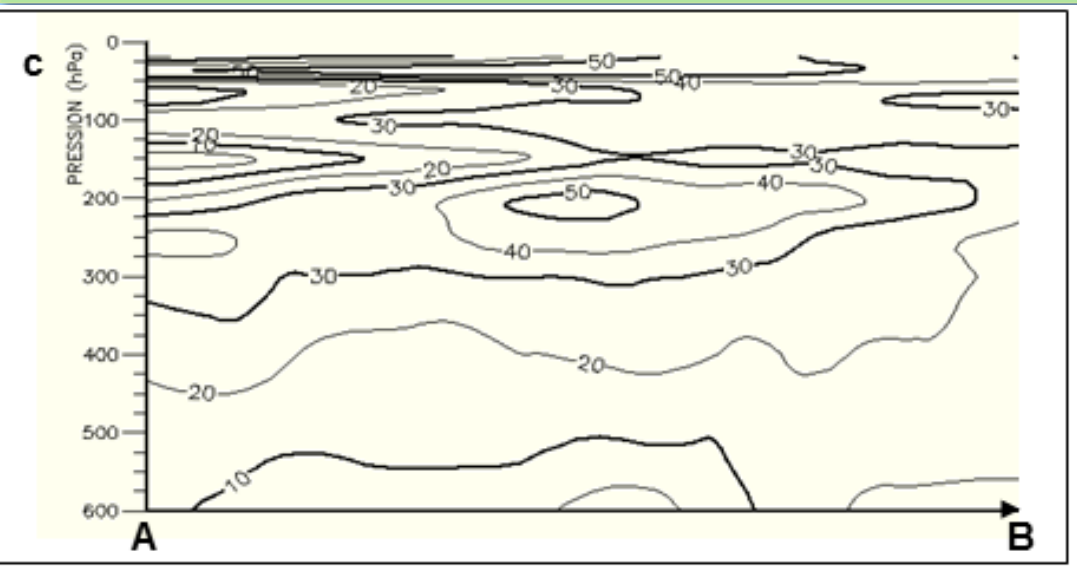


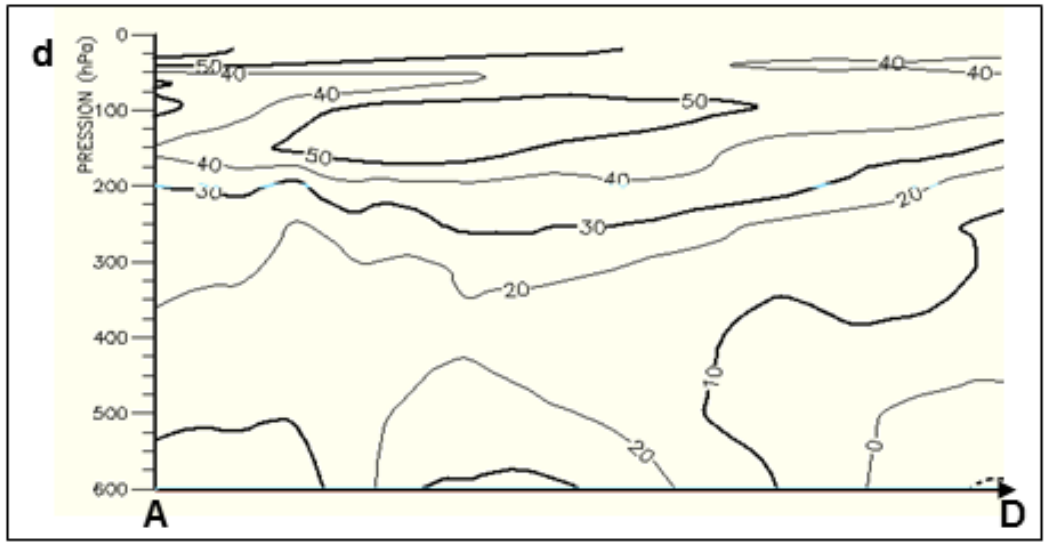


Figure 11.10: (c, d) Vertical South-North cross-sections of the zonal wind intensity along the segments AB and CD respectively, indicated on Panel (a). Fields are provided by ARPEGE operational analysis.

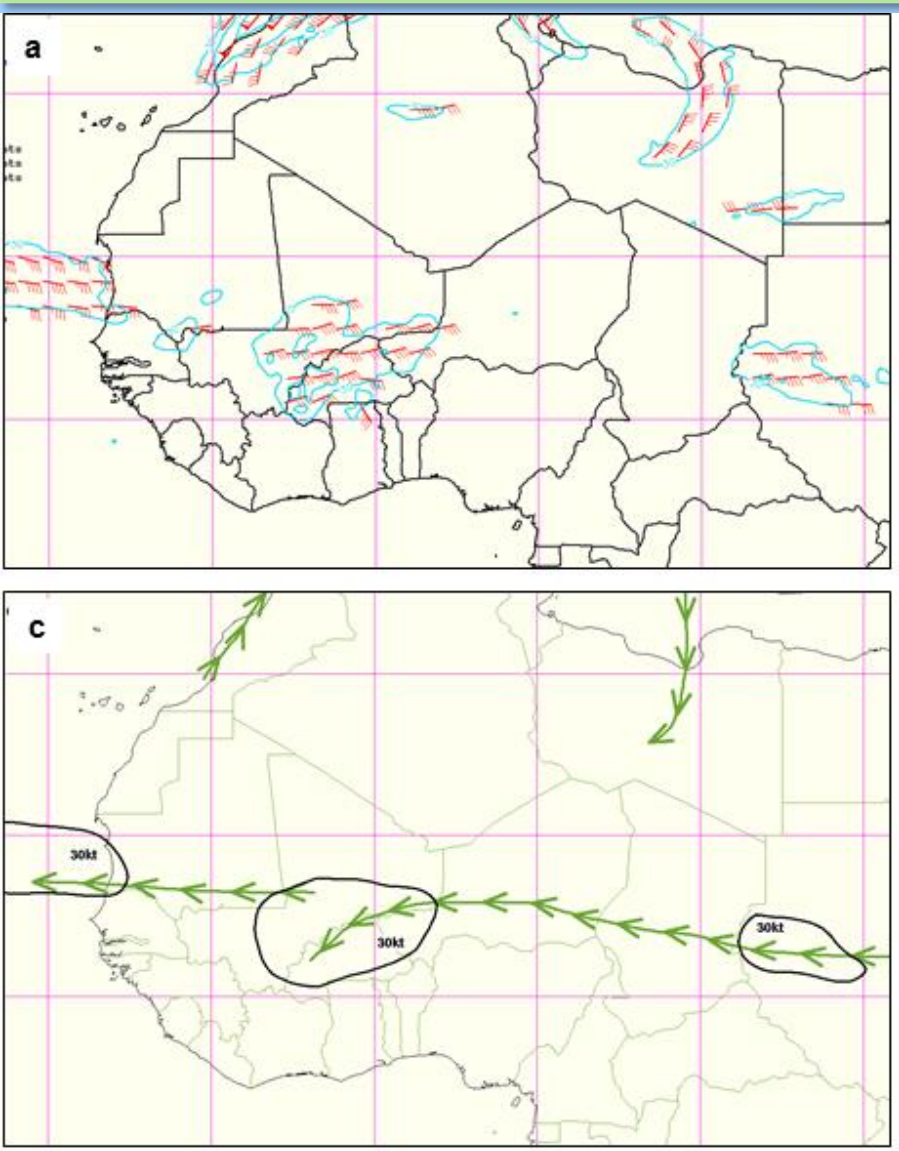
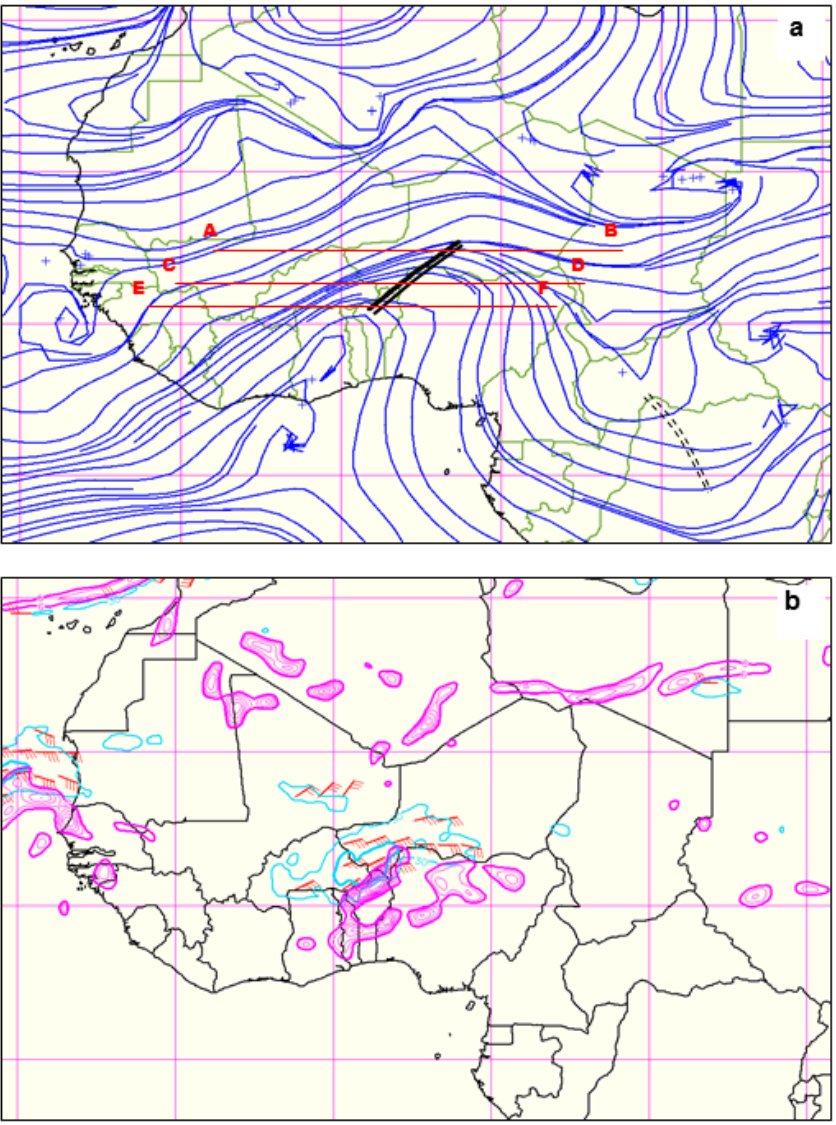


Figure 11.11: Illustration of AEJ drawing for 15 August 2012 at 1200 UTC using the "Synergie" forecasting system and the ARPEGE operational analysis. (a) Wind vectors at 600 hPa, for intensity thresholds of 30 kt and (b) 20 kt, and (c) the resulting WASA for the AEJ axis and cores, and for mid-level wind cores north of the ITD.



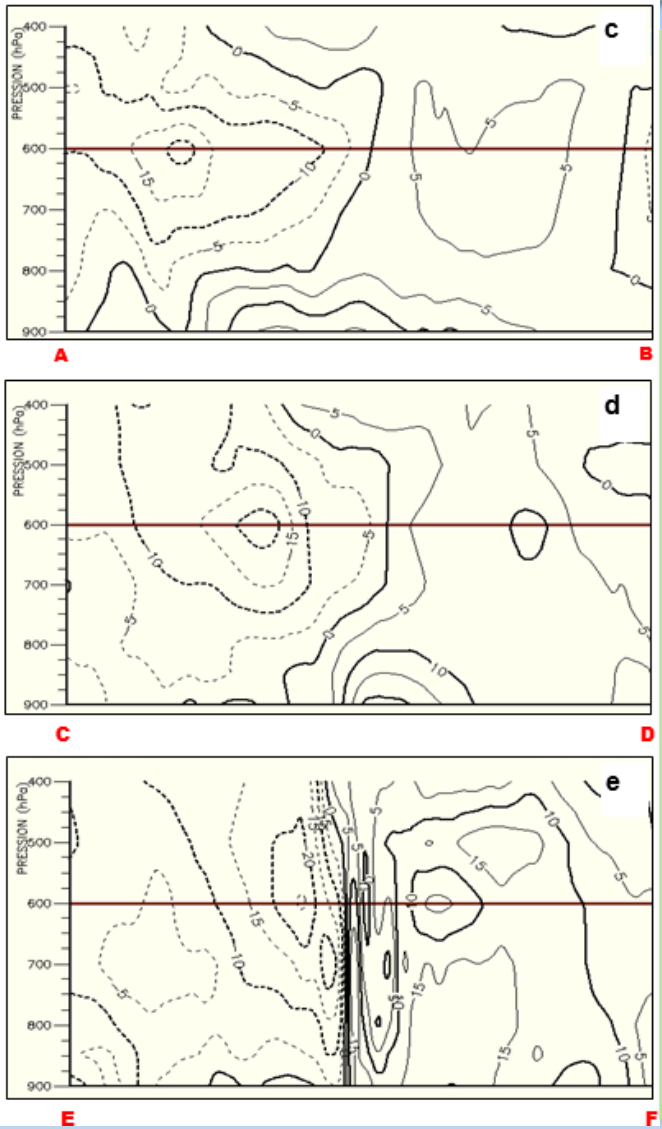


Figure 11.12: Illustration of AEW trough drawing (heavy black double line) for 15 August 2012 at 0000 UTC using the "Synergie" forecasting system and the ARPEGE operational analysis: (a) streamlines (blue) and (b) vorticity field (pink isolines above 6 10-5s-1) at 600 hPa with superposition of wind vectors (red) above 30 kt to outline the AEJ core (light blue intensity isolines) at 600 hPa. Right column (c, d and e) zonal vertical cross-sections of meridional wind (kt) at 3 latitudes: AB, CD and EF transects respectively indicated in red on panel (a). The solid dashed double lines on panel (a) corresponds the ridge.

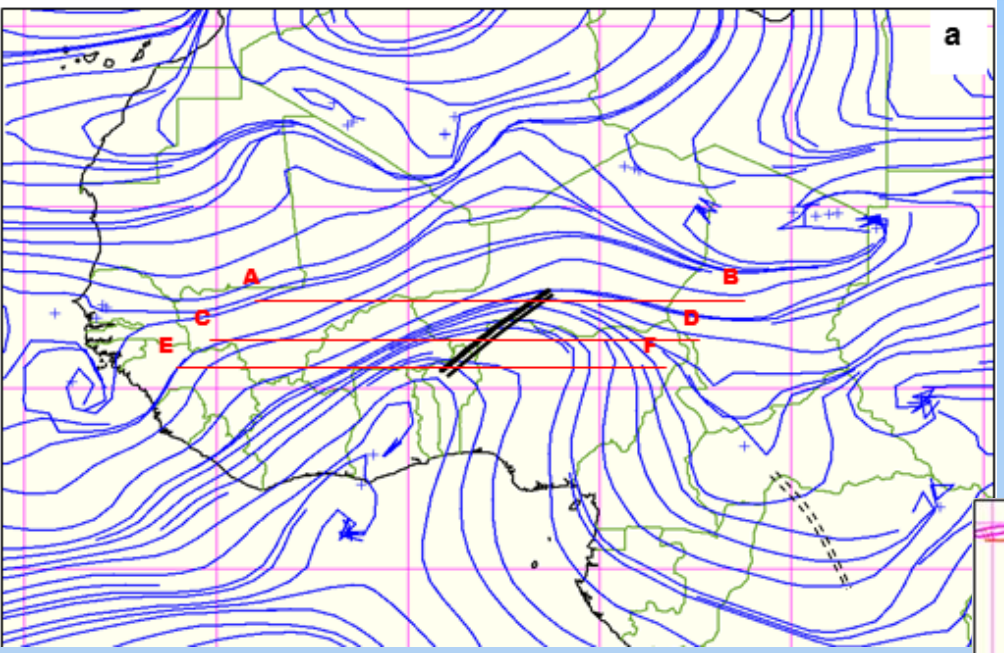
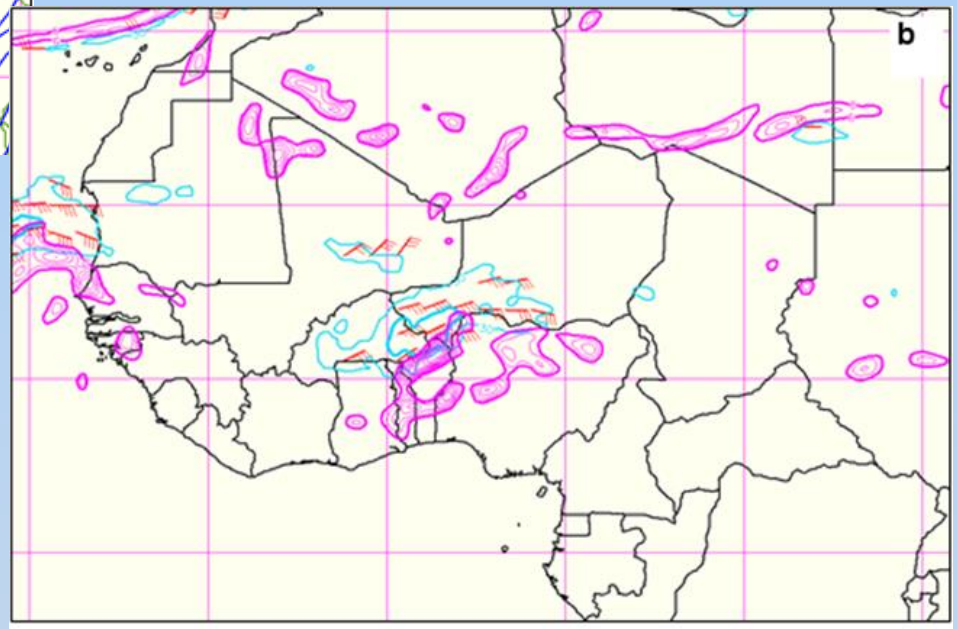


Figure 11.12: Illustration of AEW trough drawing (heavy black double line) for 15 August 2012 at 0000 UTC using the "Synergie" forecasting system and the ARPEGE operational analysis: (a) streamlines (blue) and (b) vorticity field (pink isolines above 6 10-5s-1) at 600 hPa with superposition of wind vectors (red) above 30 kt to outline the AEJ core (light blue intensity isolines) at 600 hPa.



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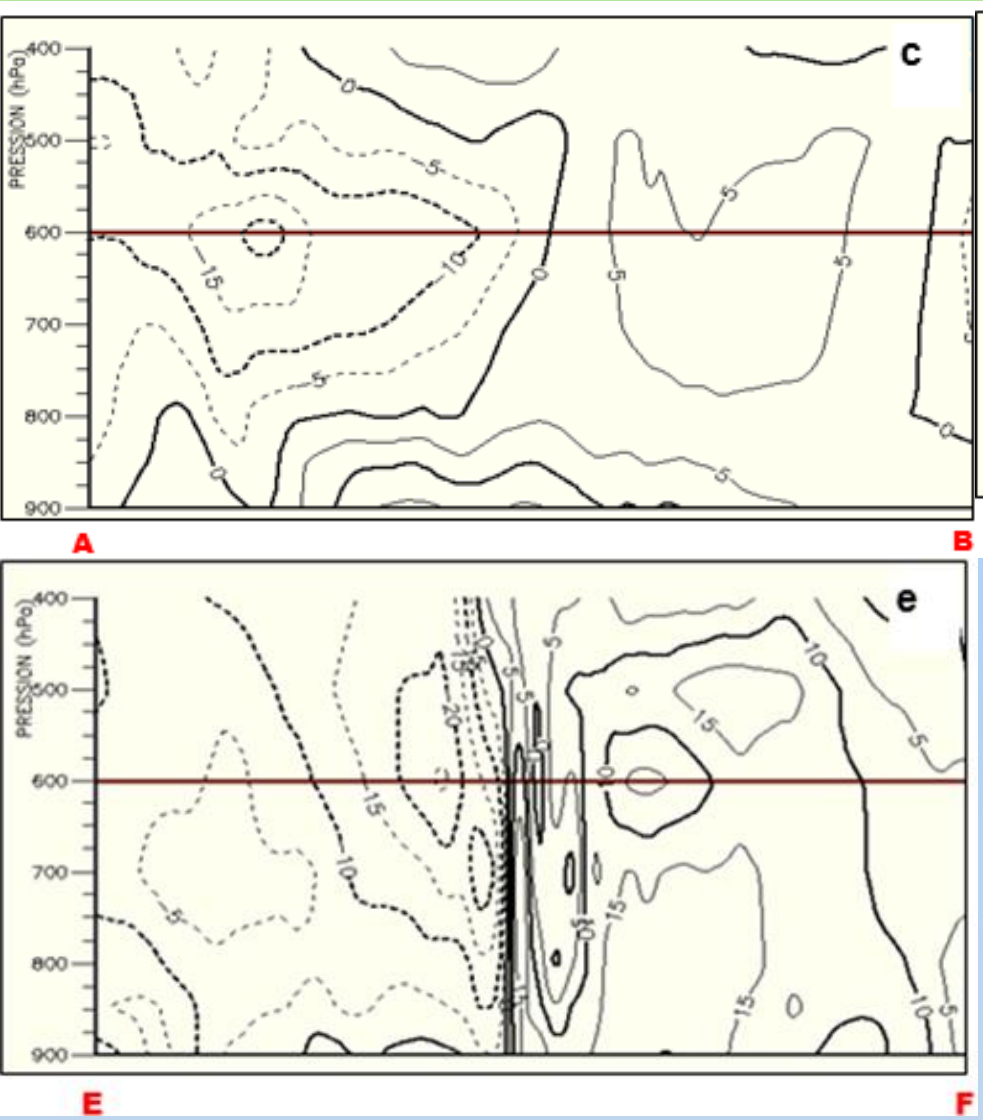

Figure 11.12: (c, d and e) zonal vertical cross-sections of meridional wind (kt) at 3 latitudes: AB, CD and EF transects respectively indicated in red on panel (a, previous slide). The solid dashed double lines on panel (a) corresponds the ridge.

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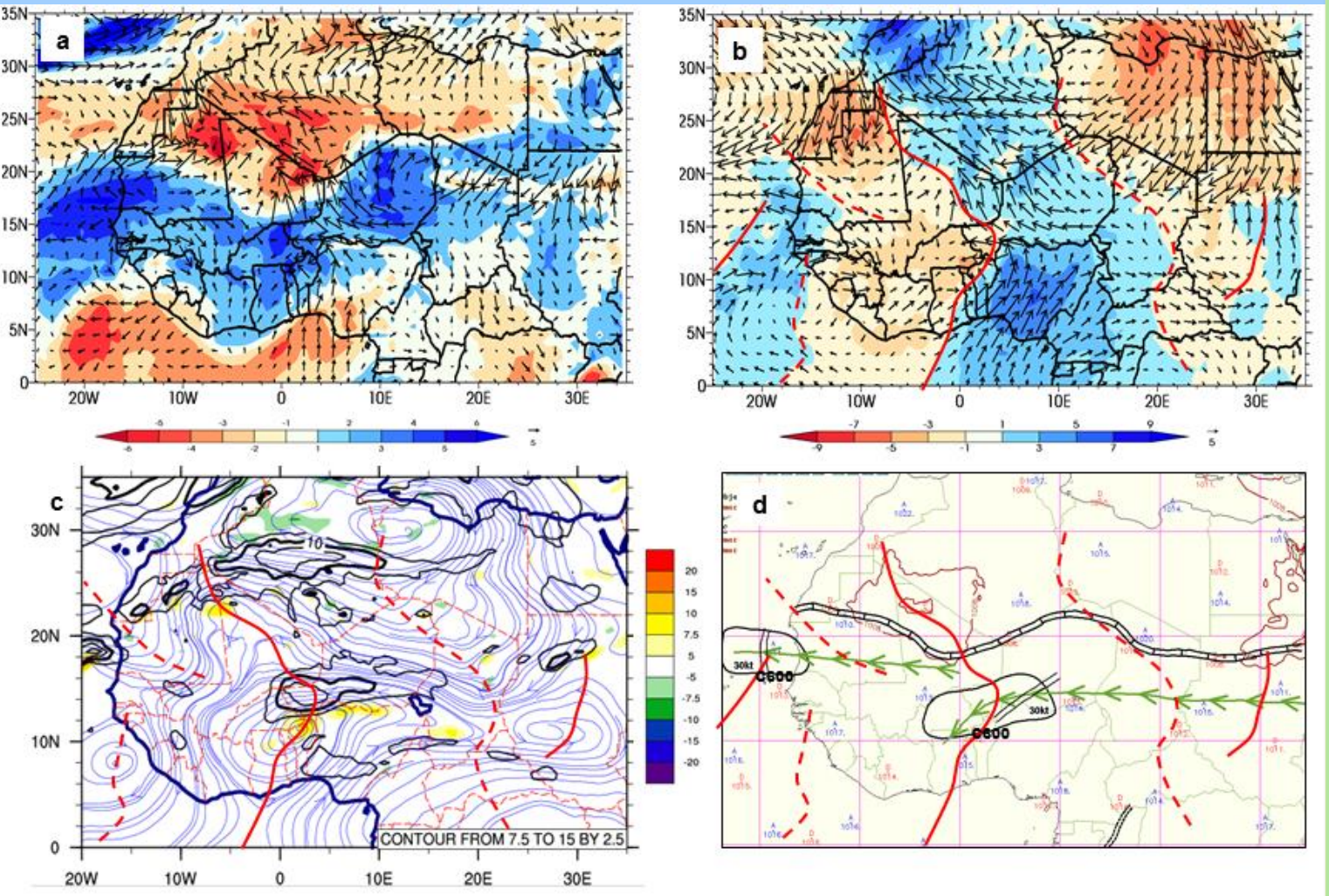

Figure 11.13: Complementary diagnostics relating to the PW perspective on AEW structure and to the "barotropic analysis", available on the MISVA site for 15 August 2011 at 0000 UTC: (a) PW* (colour, in mm) and 925 hPa horizontal wind anomalies (m s-1); (b) mean meridional wind in the 925-600 hPa layer (colour, in m s-1) and mean horizontal wind vector in the 925-850 hPa layer; (c) streamlines (blue) for the mean flow in the 950-600 hPa layer, with mean horizontal wind intensity (back isolines above 7.5 ms-1) and vorticity (colour, 10-5 s-1); (d) corresponding WASA for the AEJ and AEWs.

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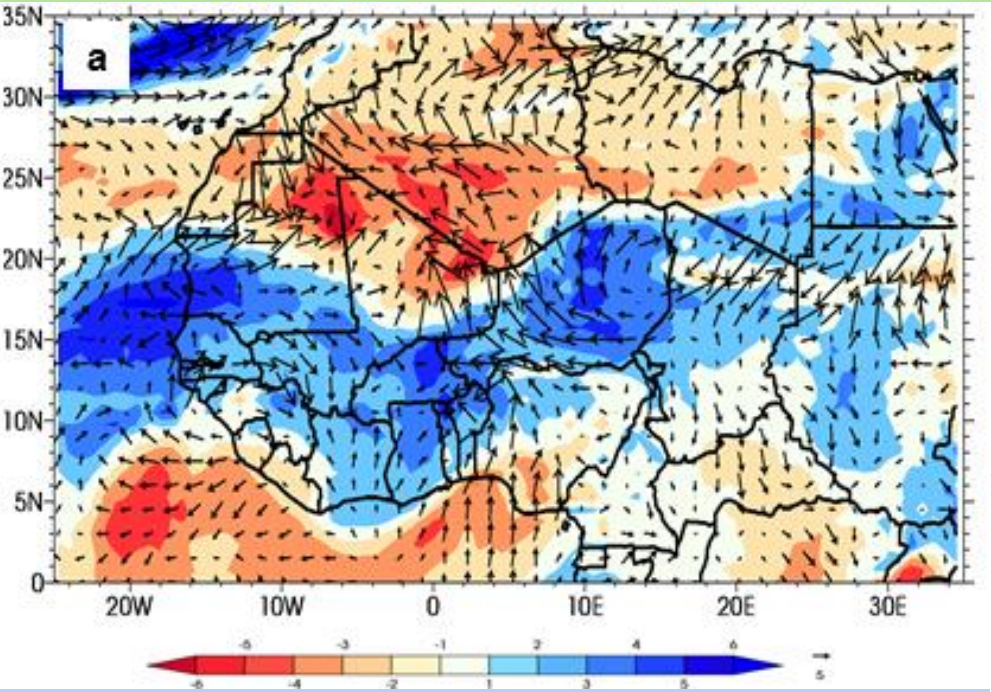

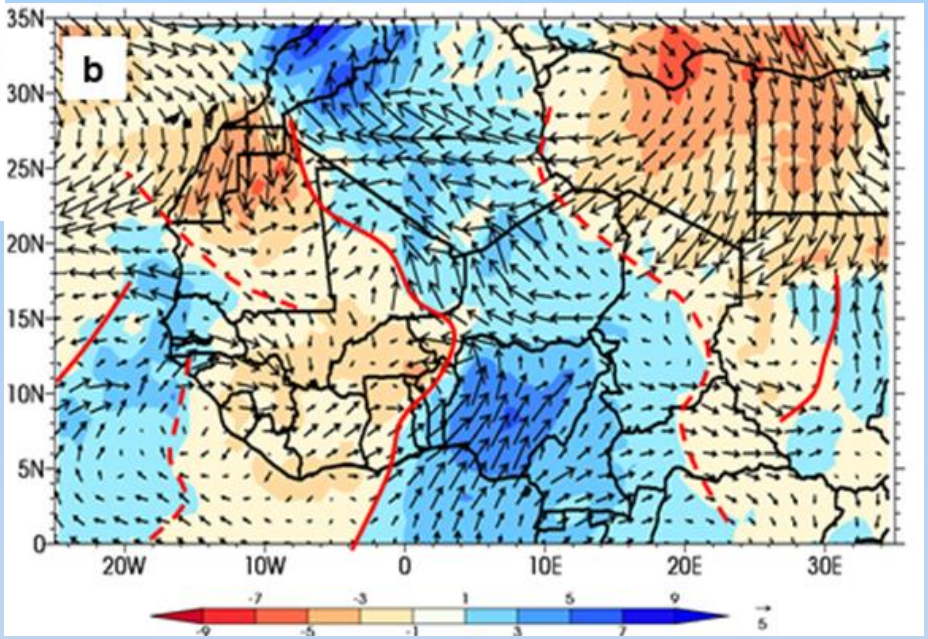

Figure 11.13: Complementary diagnostics relating to the PW perspective on AEW structure and to the "barotropic analysis", available on the MISVA site for 15 August 2011 at 0000 UTC: (a) PW* (colour, in mm) and 925 hPa horizontal wind anomalies (m s-1); (b) mean meridional wind in the 925-600 hPa layer (colour, in m s-1) and mean horizontal wind vector in the 925-850 hPa layer.

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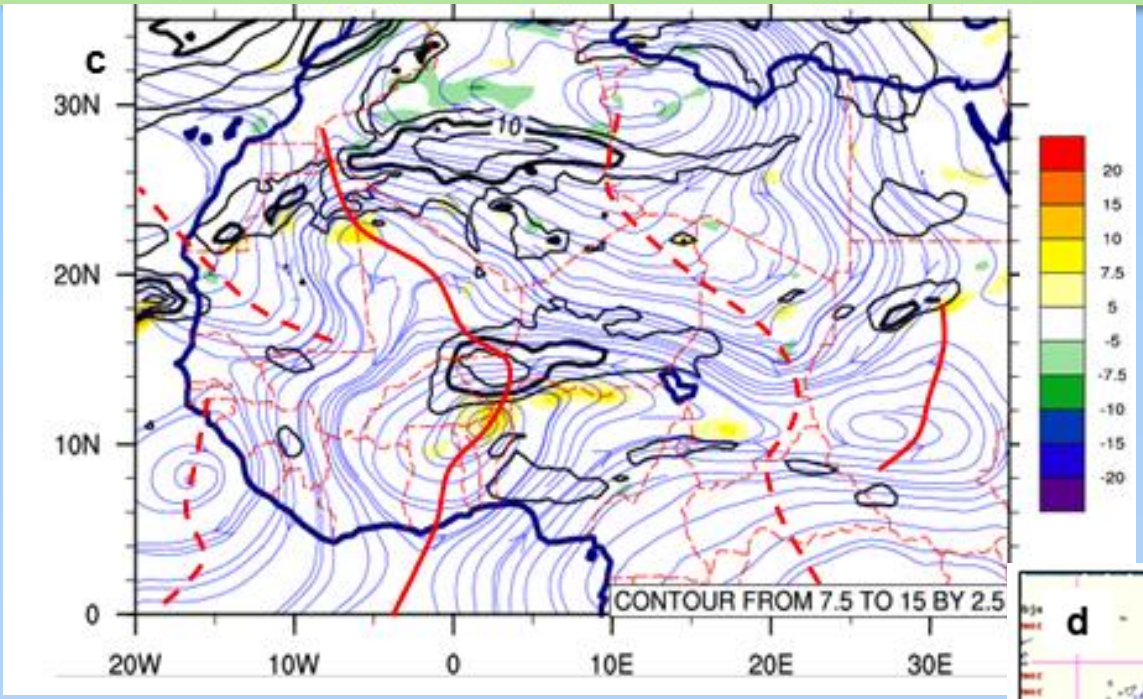

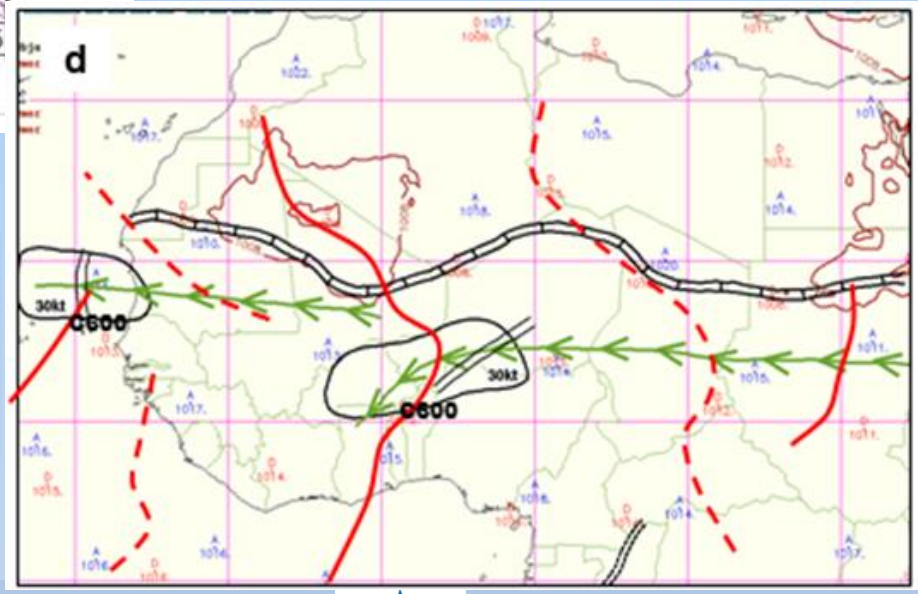

Figure 11.13: (c) streamlines (blue) for the mean flow in the 950-600 hPa layer, with mean horizontal wind intensity (back isolines above 7.5 ms-1) and vorticity (colour, 10-5 s-1); (d) corresponding WASA for the AEJ and AEWs.

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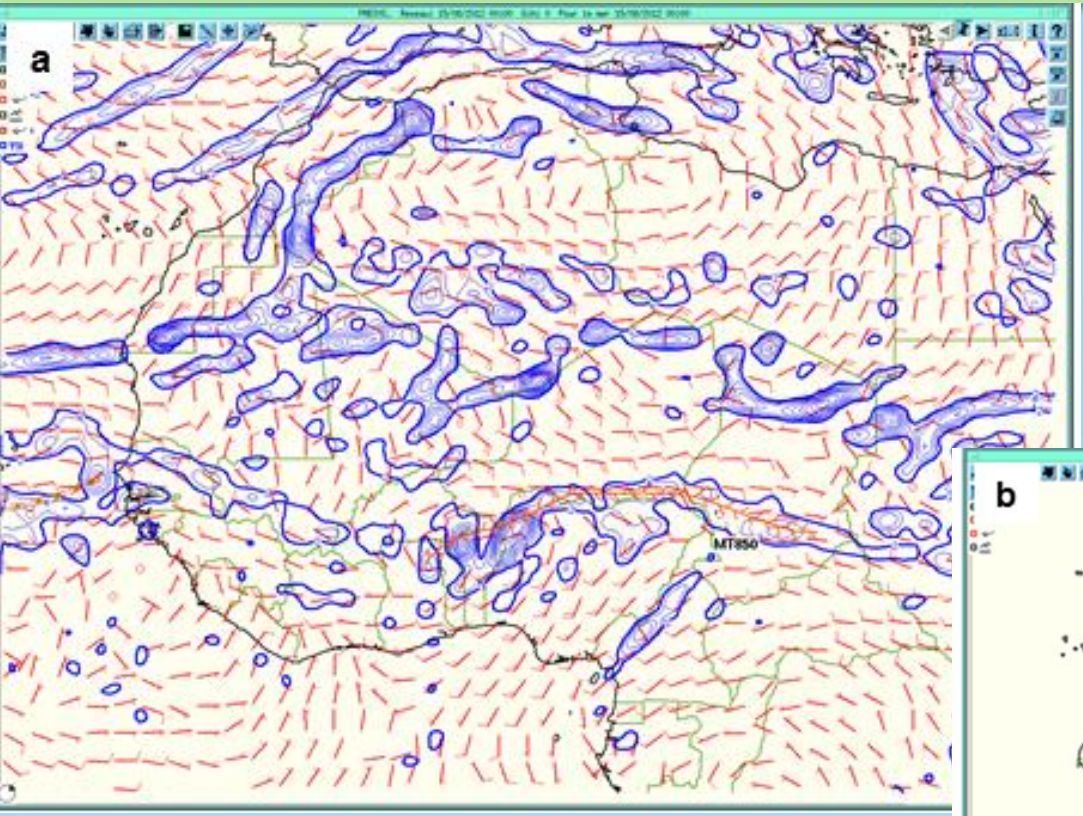

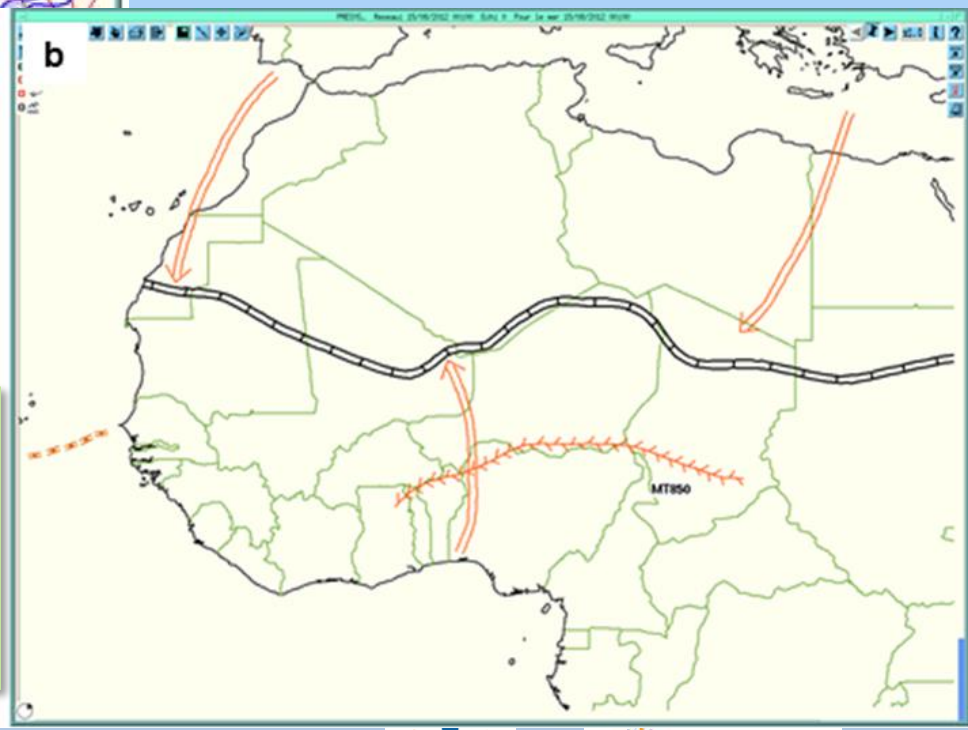

Figure 11.14: (a) Vorticity field (blue isolines above 2 x 10-5 s-1) and horizontal wind vectors (in kt) at 850 hPa, and (b) WASA map concerning monsoon features for 15 August 2011 at 0000 UTC. Drawn with the "Synergie" forecasting system and the ARPEGE operational analysis.

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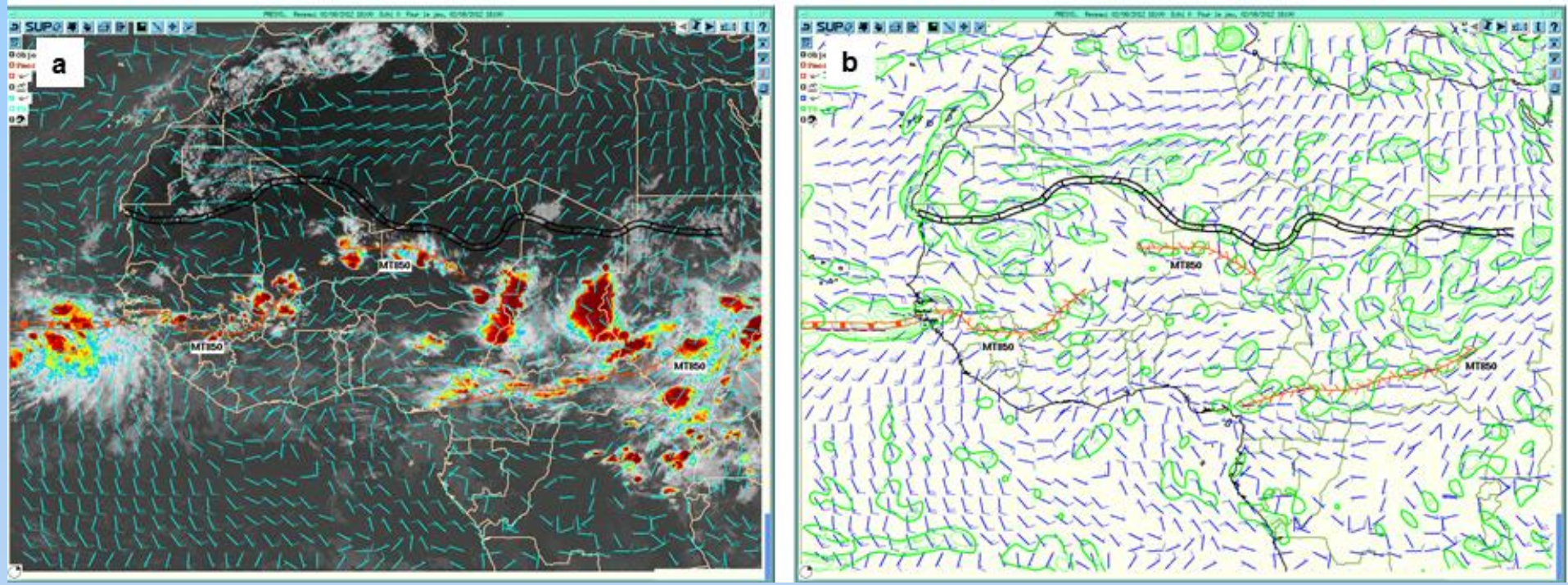

Figure 11.15: Illustration of MT drawing: (a) IR Meteosat image from EUMETSAT on 2 August 2012 at 1800 UTC, with superposition of the wind vector (blue in kt) at 850 hPa and the drawing of the ITD and MT; (b) as (a) with the IR image replaced by the relative vorticity (green > 6.10-5 s-1) at 850 hPa. In some cases troughs are better identified with streamlines. Fields are provided by the ARPEGE operational analysis.

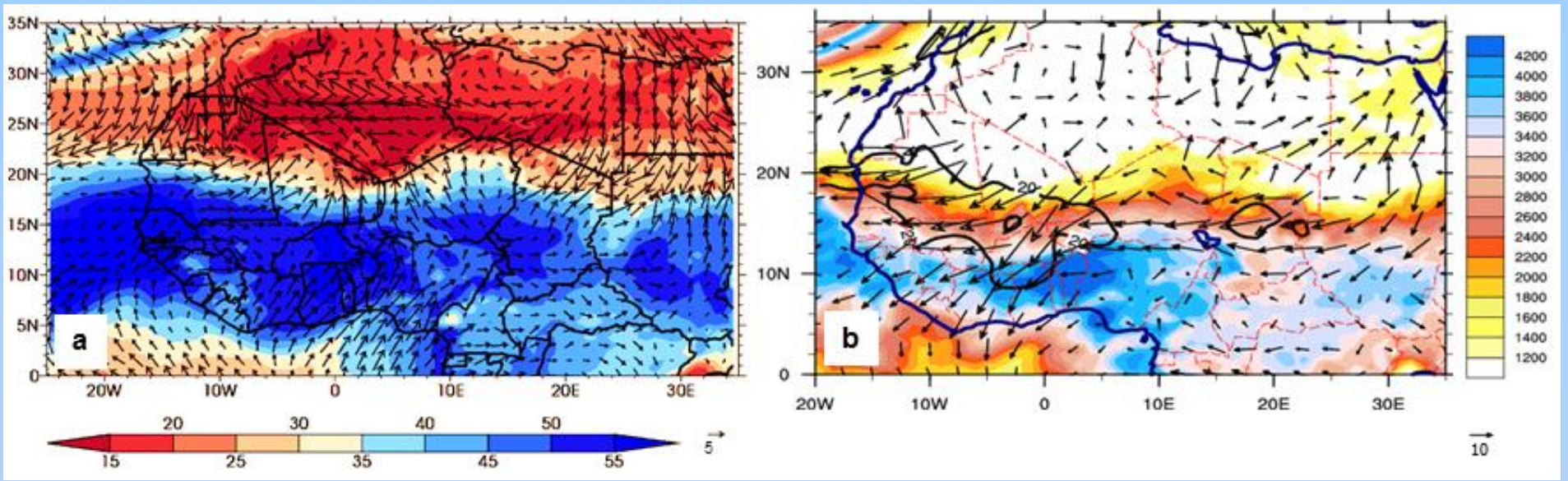

Figure 11.16: (a) PW field superposed on the 925 hPa wind vector (m s-1) and (b) monsoon equivalent depth MD (in metres) with the superposition of the wind shear vector (m s-1) in the 600-950 hPa layer for the 15 August 2012 at 00UTC. The heavy isoline on Figure. 11.16b outlines areas with shear above 20 m s-1. Data are provided by the ARPEGE operational analysis.

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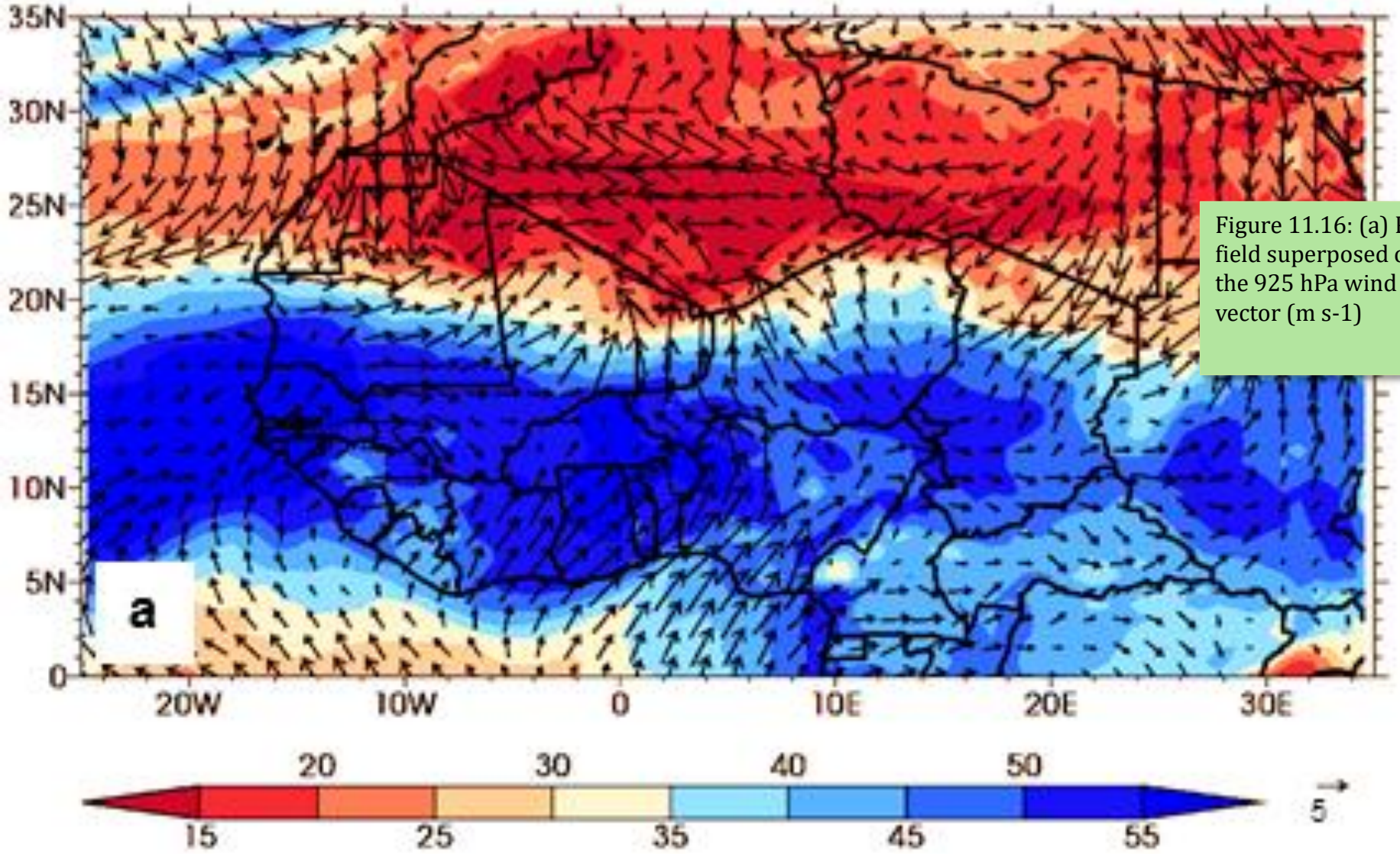

Figure 11.16: (a) PW field superposed on the 925 hPa wind vector (m s-1)

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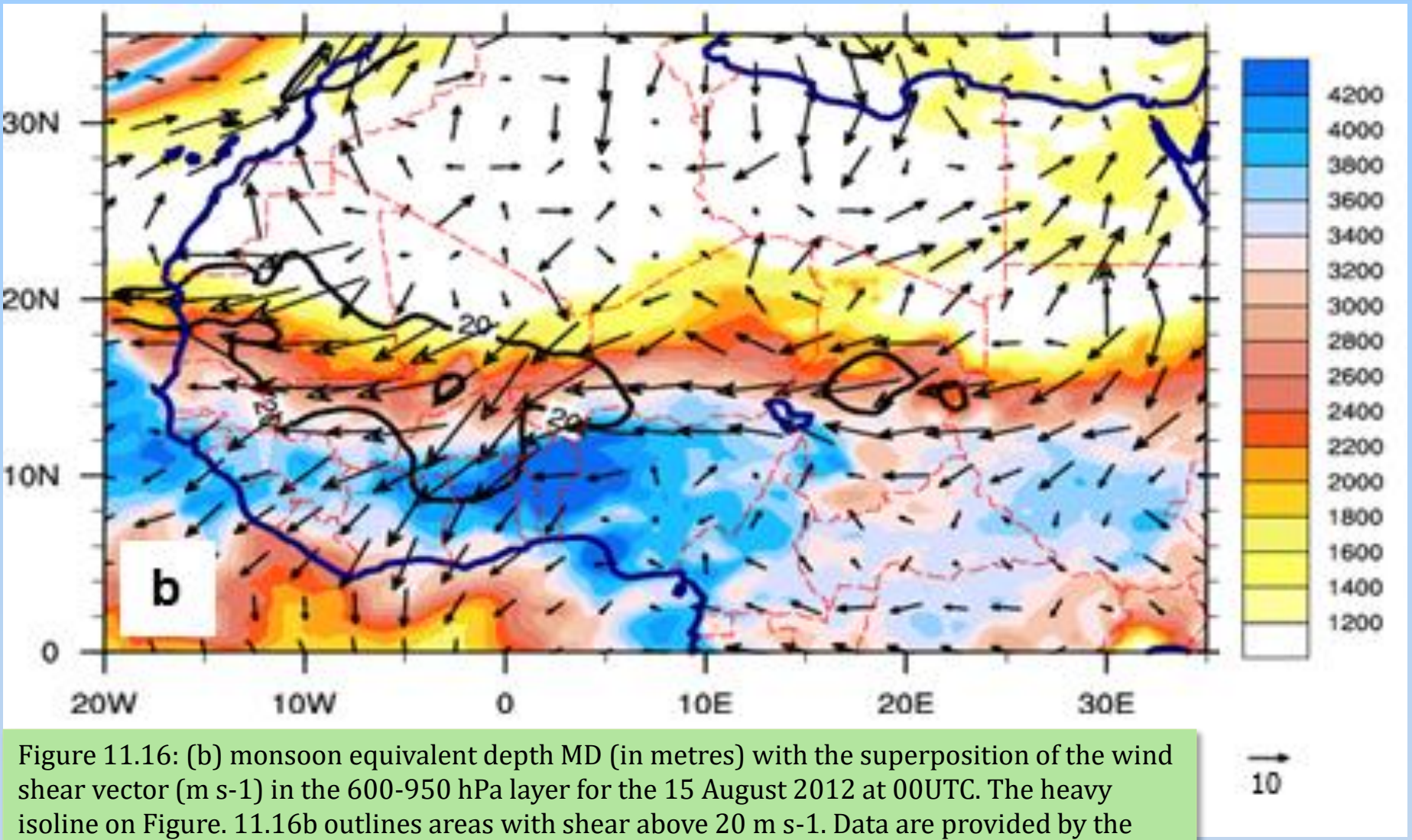

Figure 11.16: (b) monsoon equivalent depth MD (in metres) with the superposition of the wind shear vector (m s-1) in the 600-950 hPa layer for the 15 August 2012 at 00UTC. The heavy isoline on Figure. 11.16b outlines areas with shear above 20 m s-1. Data are provided by the ARPEGE operational analysis.

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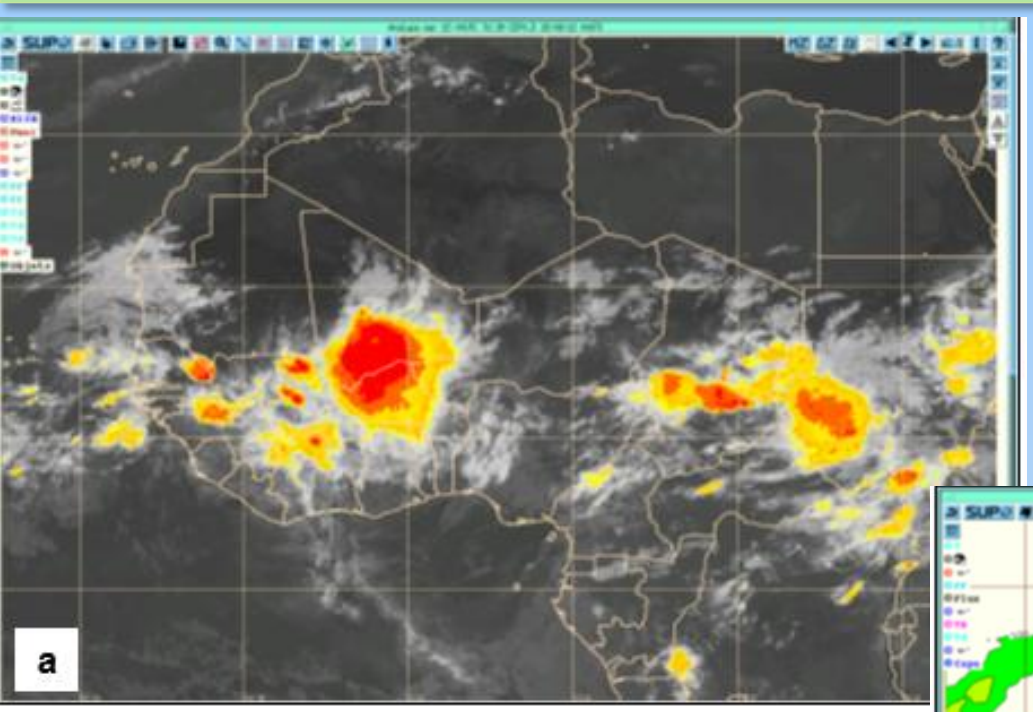

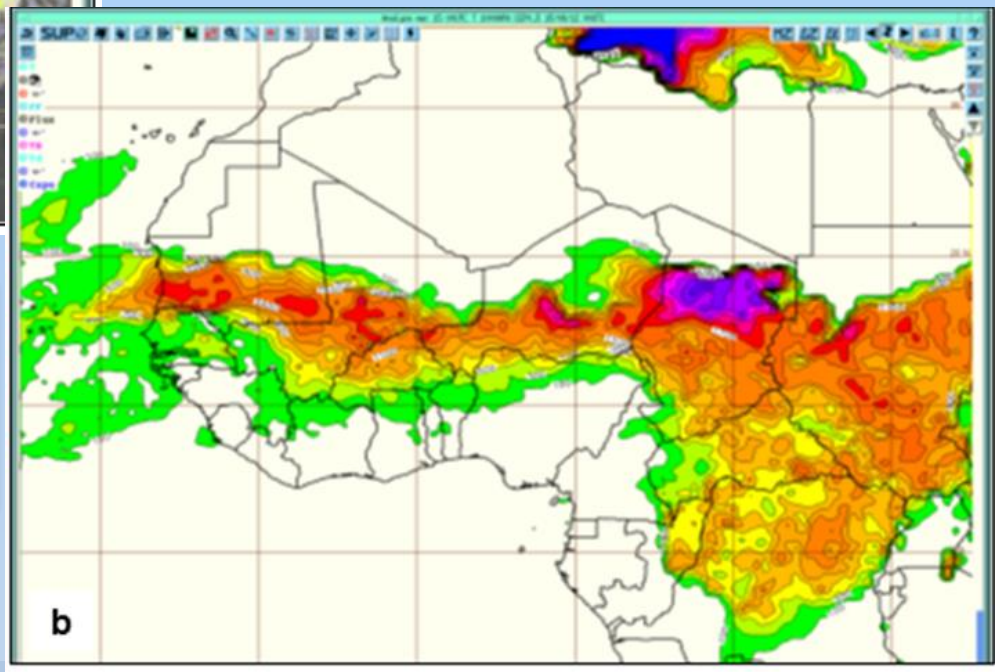

Figure 11.17: (a) IR Meteosat image (coloured areas for Tb<-65°C) and (b) CAPE field (J Kg-1) for the 15 August 2012 at 0000 UTC from the ARPEGE operational analysis.

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