

WIND PARTICULARITIES IN OLTENIA DUE TO THE PRESENCE OF THE CARPATHIAN-BALCANIC ARCH

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ABSTRACT. - **Wind particularities in Oltenia due to the presence of the Carpathian-Balcanic arch.** The paper present some results regarding the particularities of the wind in Oltenia in the circumstances of the evolution of an anticyclone of Atlantic origin up to Romania's longitudes. The study emphasizes the dominating frequency of the wind from the Western direction at the station in Southern Oltenia, whose direction is opposite to the general direction of air movement. The analysis was performed using maps and meteorological data from CMR Oltenia database.

Key Words: The Carpathians, wind intensifications from the West sector, Azoric Anticyclone.

The presence of the Carpathians on the Romania's territory leads to certain particularities in case of the evolution of the meteorological elements in a certain region and, consequently, has an influence on the weather evolution.

The wind, as a dominating element in this case, presents some particularities.

These refer to the following:

- Different direction of the wind at some meteorological stations in Oltenia, whose direction is opposite to the general direction of air movement;
- At wind intensifications, the duration and their area of manifestation;
- At the area where these intensifications are completely missing, in the conditions of the same synoptic context.

All the synoptic situations of 2008 have been studied, where a dorsal of a Western-European anticyclone (usually of the Azoric Anticyclone, very developed at temperate latitudes and western or Central-European longitudes) persisted over the western half of Romania or only over the western regions, for 12, 24 or 36 hours.

In most cases, in Oltenia wind intensifications were noticed and we considered significant the ones starting from 7m/s.

In 14% of the cases, the wind had intensifications from the eastern sector; these situations happened in general when the anticyclone dorsal had the axis oriented NW-SE, and the cold air masses penetrated in Romania through Moldavia

and Muntenia. In seldom cases, the dominating direction was southern or south-eastern (where the high pressure nuclei formed on Romania's territory).

I have chosen as a characteristic case the situation of 7-8 December 2008 where the theoretical arguments pleaded in favour of the producing of some temporary wind intensifications from the northern or north-western sector in Oltenia. I have used in this respect the aero-synoptic materials and the meteorological reports from 7 and 8 December:

-the synoptic and aerologic map of Europe on 07.12.2008 12 hours UTC (figure 1),

-the air jet on 08.12.2008 00 hours (figure 2),

-the synoptic and aerologic map of Europe on 08.12.2008 00 hours UTC (figure 3),

-the air jet on 08.12.2008 00 hours (figure 4) and table 1 with real meteorological data from the weather stations in Oltenia in the period 7-8.12.2008.

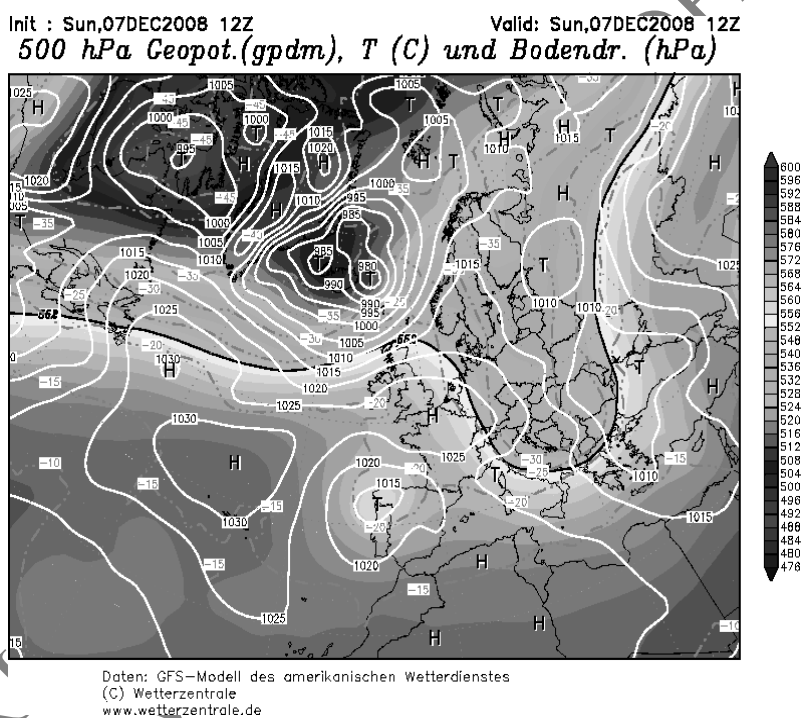
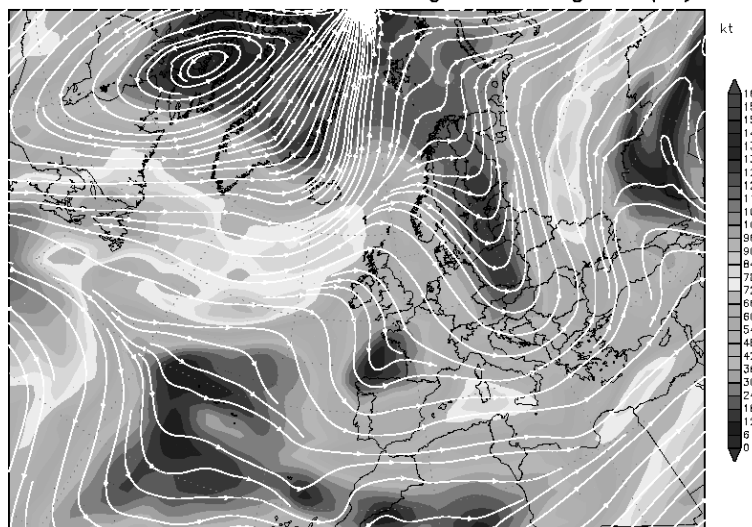


Fig. 1. EUROPA surface and 500 hPa 07.12.2008 12 hours UTC

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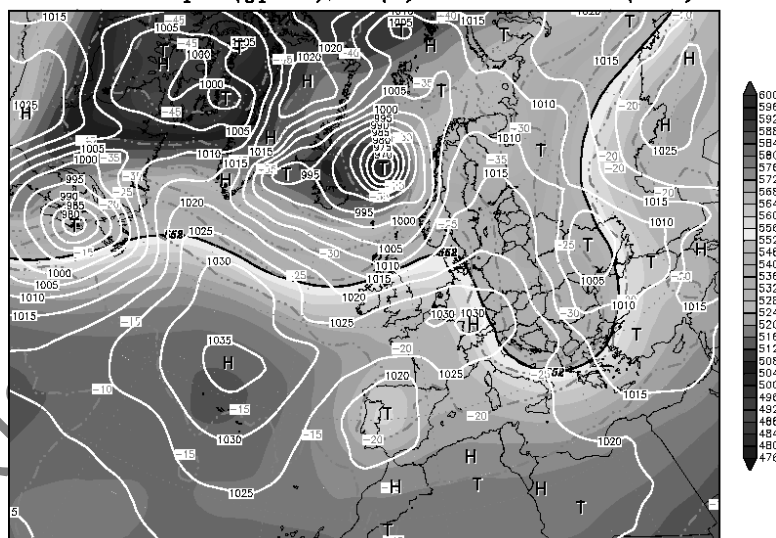
Init : Sun,07DEC2008 12Z Valid: Sun,07DEC2008 12Z
 200 hPa Stromlinien und Windgeschwindigkeit (kt)



Daten: GFS-Modell des amerikanischen Wetterdienstes
 (C) Wetterzentrale
 www.wetterzentrale.de

Fig. 2. Wind at 200 hPa on 07.12.2008, 12 hours

Init : Mon,08DEC2008 00Z Valid: Mon,08DEC2008 00Z
 500 hPa Geopot.(gpm), T (C) und Bodendr. (hPa)



Daten: GFS-Modell des amerikanischen Wetterdienstes
 (C) Wetterzentrale
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Fig. 3. EUROPA surface and 500 hPa 08.12.2008 00 hours UTC

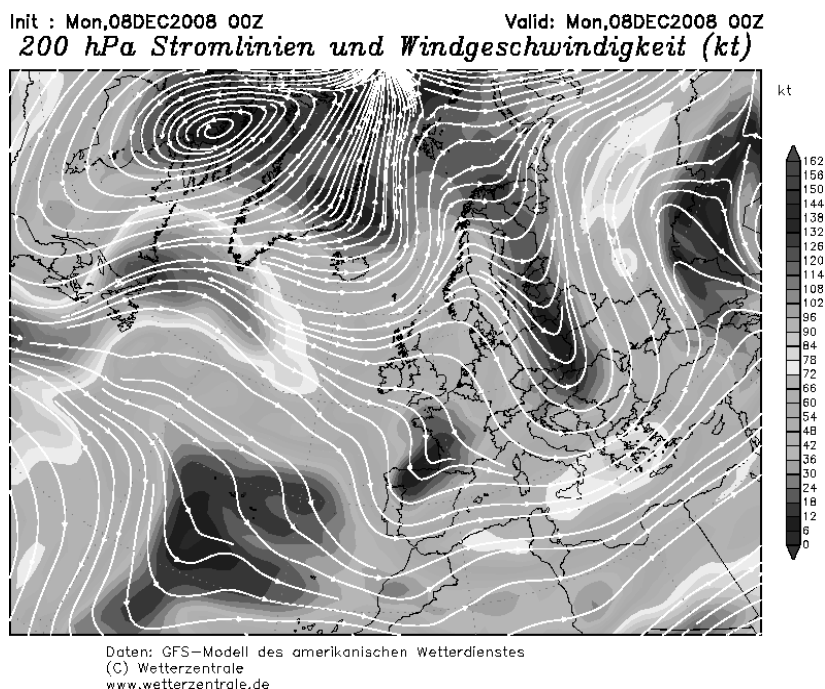


Fig. 4. Wind at 200 hPa on 08.12.2008, 00 hours

All these materials indicated the dominating direction of the wind North-West or North (with a little deviation towards East due to the divergence specific to the anticyclone's periphery) and the persistence of this direction of air movement over Oltenia for another 12 or 24 hours.

Wind intensifications were noticed, not from the northern or north-western sector, but from the western sector (table 1).

The modification of the wind direction at the stations in the southern half of Oltenia, on one hand, and the absence of these intensifications in the North-West of the region on the other hand, are closely related to the relief particularities of Oltenia.

The presence and the curved position of the Meridional Carpathians, respectively of some areas between Olt and Cerna-Dunare, as well as their link with the Balkans, protect Oltenia against the cold and powerful advections from the North, North-West or even West. Apart from the air that slips tumultuously in the Danube corridor in the case of the advections from the West or in the Olt Valley for the ones from the North, the other air masses arrive in Oltenia after they pass the Carpathian arch with the initial properties modified. In most of the analyzed cases, there are noticed cold powerful winds in the West Plain and even in Transylvania, as well as in the mountains, and their dominating direction is North

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or North-West, in conformity with the advection direction. In Oltenia, in this period we can notice a calm or light wind, with a direction that is not significant for the stations in the northern half of the region (Apa Neagra, Polovragi, Tg Logresti), and the wind intensifications appear in the South of an imaginary line Dr.Tr.Severin _ Slatina and they are deviated from the northern or north-western directions towards the western or west-north-western directions.

Table 1. Real meteorological data from the weather stations in Oltenia in the period 7-8.12.2008

Weather Station	Wind Data 07.12.2008			Wind Data 08.12.2008		
	Direction	Speed (m/s)	Speed max.	Direction	Speed (m/s)	Speed max.
Craiova	W	7	10/17	W	4	7/12
Bailesti	WNW	10	14/20	NW	6	10/16
Bechet	W	6	9/19	WNW	6	9/15
Calafat	SSW	6	9/17	WNW	5	9/17
Slatina	WNW	4	7/15	WNW	2	3
Caracal	W	6	8/15	W	4	5
Dragasani	W	5	7/15	NW	2	3
Apa Neagra	W	3	6	W	1	4
Polovragi	WSW	4	7	NW	2	4
Tg.Logresti	W	1	4	NW	1	3
Bacles	W	4	7	W	3	5
Halanga	WNW	5	10/14	W	8	10/14
Tg. Jiu	NNE	1	5/12	E	2	5/14
Dr.Tr.Severin	NNE	4	7/16	NW	4	9/18
Rm.Valcea	SSE	2	4/11	N	2	3
Voineasa	N	2	4	NW	1	3

The reason for this situation is that the dorsal of the Azoric Anticyclone heads towards the West of Romania, in the posterior part of some active and rapid cyclones, that slide along the 48-50 parallels of northern latitude. Thus, although the air circulation in the cyclone-anticyclone contact zone is approximately North-South, over Oltenia the air deviates from this direction. The modification of the wind direction takes place, on one hand, as a result of the dynamic effect of the escalation of the Meridional Carpathians by the air masses in motion and from the appearance of the foen phenomenon in the North of the region – the mountain subdivision – with the ulterior necessity of the straightening to the dominating circulation and, on the other hand, as a general effect of engaging the peripheric air masses towards the vortex of the active cyclone, particularly for the Oltenia's Plain.

Consequently, in the immediate vicinity of the mountain area, in the area under the wind, some stationary vortices are formed with a horizontal axis or in the

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phase of strong turbulence, depending on the speed of the general current. The characteristics of the air movement on the slopes under the wind are closely connected to the relief particularities, among which with the possibility of the deviated air that entered the local stationary vortices to reintegrate itself in the general circulation from the studied zone.

So, we could expect that at a certain distance from the obstacle the current might turn to the initial direction. But in the studied case this thing does not happen, and the intervention of the Carpathians arch imposes in this process. The effect of the movement of the air masses towards East to an Eastern-European cyclonic area and the effect of channeling the Danube Valley, combined, can explain the differences of the intensity and direction of the wind in northern Oltenia as compared to the ones in the South.

This paper tries to explain the wind frequency from the West direction at the weather stations in the southern half of Oltenia, in the aerosynoptic conditions in which the wind should have had the North-South or the North-West – South-East direction.

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