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Launch opportunities for transmediterranean, transatlantic and local flights from Trapani-Milo base due to meteo conditions

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Meteo Forecast Balloons Launch Base Trapani-Milo

Abstract. Through the comparation of the radiosondings and winds data acquired from 1985 to 1995 in Trapani-Birgi's and Trapani-Milo's, with the barics configuration s.l.p. and 500hPa, the Trapani-Milo Balloons Launch Base has been found suitable to perform transmediterranean, transtlantic and local balloon flights during the nearly whole calendar year.

Key words. Launch opportunities – Meteo conditions

1. Introduction

In the western Sicily, and so in Trapani-Milo, weather conditions are influenced by the trajectory of the Atlantic disturbances that, in their moving generally from west to east, affect the Mediterranean basin. In winter, the thermal equator's changing position to the tropic of Capricorn makes these disturbances change their trajectory generally into the middle and southern Tyrrenian Sea; so, generally every six days, Sicily is directly affected by the passing of warm and cold fronts which make the weather regularly changeable in its temperature and moving. This climatologic characteristic is marked in Figure 1, where we can find the percentages of the days with a wind lower than 3 kts during the winter season from 1985 to 1995 (these data refer to Birgi's airport about 10 kms from Milo-Base).

These percentages are higher only in December. Infact, in this month, the Atlantic anticyclone is most likely to invade the southern Mediterranean Sea, and affects Sicily and particularly its western region where rainfalls are almost scarce. In autumn, Trapani is in the lower edge of the disturbances, and the weather conditions are changeable and variable. Infact, we can find violent storms and heavy showers. In spring the weather is rainy during the first half of the season when the African disturbances, in their moving to NE, pass across Sicily. In the second half of the season the weather is mild and the days with wind calm are the 50%. These weather conditions favour the balloon's launching, but they are very changeable in the stratosphere, especially for wind direction; the scientific payload could fail into the sea (the probability of this happening is very high). In summer, exactly from June 20^{th} to august 20^{m}, the Azores' anticyclone spreads to the east and lasts for a long time, favouring weather conditions with breeze winds. The weather conditions (in the stratosphere) favour longlife flights and their following recovery in Spain and in the U.S.A. The direction of the stratospheric winds is along the

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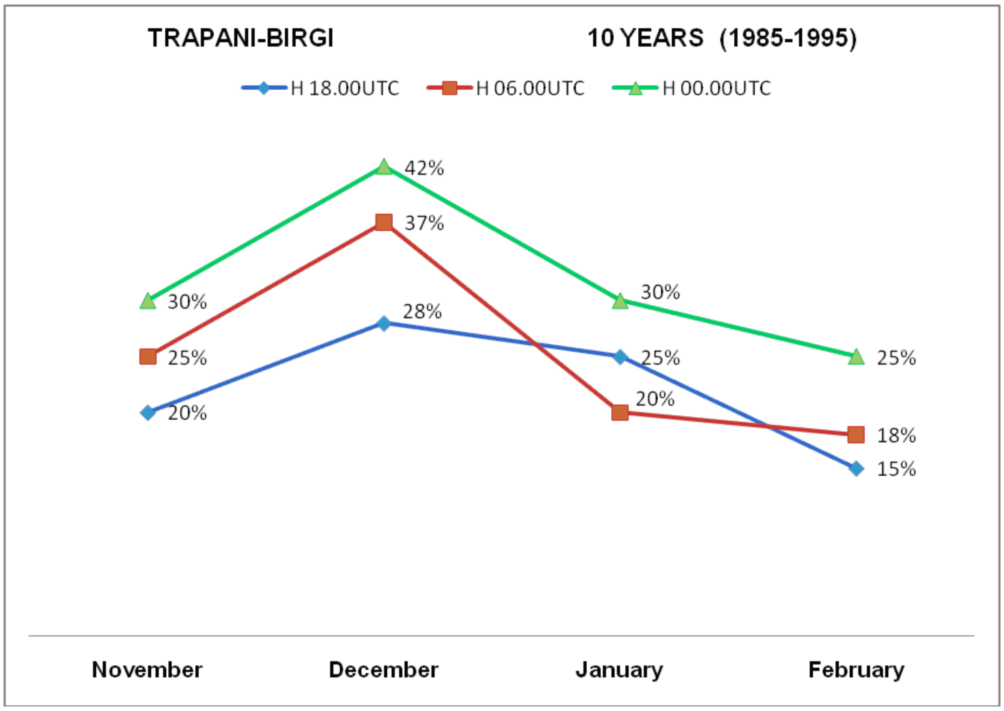

Fig. 1. Days with wind-calms monthly percentage (wind intensity <3 kts).

latitudes with some local) and tight changes: but we'll deal with its causes later on.

2. Typical weather conditions from July to August

On the basis of a five-year statistics made for the stratospheric balloon's launching, we can describe some typical configurations, which affect the western Sicily in summer, and we can mark the most favourable ones to launch the balloons. But it's only a general typology because the intensity of the phenomena (especially for the wind) is very changeable, though it keep its standards regular, according to the higher or the lower adaptability of the real situation to the typical situation. In summer the Atlantic disturbances (when there's a high pressure on the Mediterranean Sea) run into the north of the 40^m latitude and marginally affect the northern Alps. In this situation the sky is clear and in the morning the high sun radiation creates an about <10 kts sea breeze: in the night, instead, there's a 3-5 kts and intermittent breeze. In the period of transition, about from 05.00/L to 09.00/L, there's no wind and the weather conditions favour the balloon's launching. The weather conditions get very fair even in the night when a cold front, crossing over the Alps in its moving from S-E, causes a feeble depression on the middle Italy. This baric situation favours a feeble influx of air from north; not too cold and dry on Sicily, which reduces the breezes in the night, and the prolongation of the period of transition. In the last 5 years there is been a large percentage (80%) of launchings from Milo-Base, made in the above-mentioned weather conditions. Sometimes (one or two times in the month), the Atlantic disturbance penetrates into the Mediterranean from W and it marginally affects Sicily, instead of crossing the northern Alps from N-W. This condition favours a high attraction of warm and west air from Sahara desert, which appears especially on the western Sicily with high winds first blowing from S-E, then turning in a clockwise direction until they blow from S-W. The following passage of the front and of this depression re-establishes the anticyclonic situation. During the first phase, the wind speed can reach its highest point (30 kts), because of the ”VENTURI” effect produced by the Sicily Channel. This phenomenon lasts from 1 to 4 days. We can foresee the development of the circulation scheme, which is a prelude to an attraction of warm air from the southern quadrants either by the analysis of the circulation scheme or using a meteorological control of the wind data of Pantelleria's and Lampedusa's meteo stations, which foresee the coming of the phenomenon to Trapani about 3 hours before.

Even in the morning, in summer, when there's not a prevailing circulation, a breeze condition establishes on Milo-Base, but it makes the balloon pumping and launching quite impossible.