# EXTENSION OF MEDITERRANEAN SUMMER TOWARDS SPRING

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The authors have already reported an important and positive 2 m temperature tendency in May-June at Palma (Mallorca), as well as a simultaneous and highly correlated strong increase of local 500 hPa geopotential. The present work seeks to frame these observed tendencies in a wider seasonal and geographical context.

A first finding is the high correlation between 2 m temperature and 500 hPa geopotential only during the warmer months. This suggests different mechanisms for temperature change acting throughout the year. High near-surface temperatures in the warm season would be mostly associated with the dominance of a subtropical anticyclone, associated with the northern edge of the Western Mediterranean section of the Hadley circulation. Therefore, higher temperatures in this season would mean an extension of the climatic inter-tropical area towards the region.

Highest positive low-level temperature tendencies in May-June are not a local particularity but they are also observed in a relatively wide area over the Western Mediterranean. Different geographical patterns are observed in other periods of the year. In July-August, for instance, the most intense positive pole of low-level temperature tendency drifts to the East-Northeast, towards Russia. On the other hand, the 500 hPa geopotential tendencies show the following pattern: ridge of intense positive tendency over West Mediterranean in May-June, and this ridge displaced to the north-east of the Mediterranean in July-August.

With regard to the 500 hPa structures present in May-June, a PC analysis of the field followed by a multiple lineal regression of surface temperature against the leading PCs shows that half of the temperature tendency is explained by the time evolution of a geopotential ridge centered over the Western Mediterranean.

These results are compatible with a northern expansion of the Hadley circulation, whose downward branch in late spring would now be further focused in the West Mediterranean zone.