

FF: The water budget and precipitation efficiency of the Medicane occurring in November 2011

Lluís Fita (1), Emmanouil Flaounas (2)

Laboratoire de Météorologie Dynamique, UPMC-Jussieu, CNRS, Paris, France

National Observatory of Athens, Athens, Greece

Abstract

The most intense cyclones in the Mediterranean are known to acquire characteristics of tropical hurricanes. These atmospheric systems are related to the most severe environmental hazards in the region, such as windstorms, floods etc.

In this study we present the results of a new technique focused on the water budget of cyclones which we applied to the Medicane case of November 2011, one of the strongest ever occurring in the Mediterranean. We decompose the atmospheric water budget in different terms, respect to the WRF model outputs from its microphysics and PBL schemes, as also, respect to the model simulated horizontal, vertical and diffusive moisture flux. Usually water budget analysis refers to the volume integration (mostly vertical column sums) of all the terms. However, in our case, there is only a temporal integration which is automatically done at each internal time-step of the model and at the same time at each grid point. Therefore, we achieve a higher detailed perspective of the moist dynamics in such events, providing three dimensional aspects of the water budget of cyclones. Finally, we calculate the precipitation efficiency of the Medicane evaluating thus the system's capacity in attributing extreme rainfall, respect to the water vapor drawn to its core. This study has been done in the framework of the EU BEYOND project.