



## **Forecast sensitivity analysis of the November 7th 2014 medicane**

Aina Maimó and Víctor Homar

Meteorology group, Universitat de les Illes Balears, Palma de Mallorca, Spain (aina.maimo@uib.cat)

Severe weather in the Western Mediterranean has important effects on population and socioeconomic assets. Cyclones produce a significant portion of severe phenomena in the region. A specific type of cyclone known as medicane (Mediterranean hurricane) shows very different characteristics from typical mid-latitude cyclones for its tropical-like features. This Mediterranean cyclone usually generates over the sea and affects the coast with intense winds and precipitation rates. A relevant case occurred during the morning of 7th Novembre 2014 to the south and southeast of Sicily. Investigating the sensitivities of this medicane formation will shed light on the physical processes that drive the formation of this rare but hazardous systems. The WRF adjoint model (WRFPLUS) calculates sensitivities of specific forecast aspects of interest, which is quantified by means of a scalar response function. It is noteworthy that the model shows consistent sensitivity fields for various response functions representing cyclone intensity, which shows the robustness of the WRFPLUS model. However, this does not guarantee an accurate depiction of sensitivity fields in their physical interpretation and linearity tests show that this model accuracy is heavily dependent on the presence or absence of convection. A description of the most sensitive fields for the medicane formation and the physical interpretation will be provided.