



## **Observational and numerical analysis of a Mediterranean “hurricane” over south-eastern Italy**

A. Moscatello (1), F. Pacifico (2), S. Davolio (2), M. M. Miglietta (1) and R. Rotunno (3)

(1) ISAC-CNR, Lecce, Italy, (2) ISAC-CNR, Bologna, Italy, (3) NCAR, Bolder, Colorado, USA (m.miglietta@isac.cnr.it / Fax: +39 0832298716)

The presence of a subsynoptic-scale vortex, formed over the Mediterranean Sea, has been documented in south-eastern Italy on 26 September 2006. Radar maps, Meteosat Second Generation satellite images and surface stations reveal that the vortex had features similar to those of tropical cyclones.

Numerical simulations have been performed implementing two different forecasting chains. One is based on the hydrostatic model BOLAM and the non hydrostatic model MOLOCH, using a 1-way nesting procedure. The second is based on the Weather Research and Forecasting Model (WRF), set up with two domains, in a 2-way nesting configuration.

Model forecasts are able to properly capture timing and intensity of the small-scale cyclone development, although the results show strong sensitivity to the specification of the initial and boundary conditions.

An analysis of the mechanisms responsible for the development and the maintenance of the cyclone over the sea has also been performed. Simulations show that the surface fluxes (sensible and latent heat) are relevant during the initial phase of development of the disturbance, when a shallow depression is evolving south of Sicily. Later, as the cyclone deepens and passes over the Ionian Sea and Adriatic Sea, latent heat release plays a major role in amplifying the vortex, while the role of the surface fluxes seems to be less relevant.

The modelling study agrees with the observational analysis identifying in this small-

scale depression the typical characteristics of a Mediterranean tropical-like cyclone.