Variability of warm season convective clouds over Europe and the Mediterranean

V. Levizzani (1), R. Ginnetti (1), M. Masotti (1), S. Melani (2), A. Antonini, (2), M. Pasqui (2), A. Ortolani (2), A. G. Laing (3), R. E. Carbone (3)

(1) CNR-ISAC, Bologna, Italy, (2) LaMMA, Sesto Fiorentino, Italy, (3) NCAR, Boulder, CO, USA

(v.levizzani@isac.cnr.it / Fax: +39-051-6399749 / Phone: +39-051-6398015)

A dataset consisting of 5 years of Meteosat IR data every half hour has been exploited to investigate the span and duration of convective systems over Europe and the Mediterranean during summer months (May-August). The European domain spans a latitude belt 30 - 54 N and a longitude domain 15 W – 40 E to capture the North Atlantic jet and the circulation from North Africa which interests the western and central Mediterranean. May to August data were considered. Hovmöller longitude-time diagrams are used to retrieve the span, duration and phase speed of the convective systems. A Fourier power spectrum analysis is used to identify daily cycles and propagation features of the systems.

The role of orography in determining the convection strength and propagation comes out quite evident. The Atlas, Pyrenees, Alps and Carpathians heavily influence the circulation and convective cloud development. Sea-land effects appear also responsible of convective development along the Atlantic French coast and over the Black Sea. At the same time, the propagation and convective re-generation component of the mesoscale systems is observed. NCEP reanalysis data for the period are also used to identify the relevant mesoscale features.

These results show a potential for the improvement of NWP models and for a regional climate characterization in the Mediterranean area, which is a clear hot spot in a changing climate scenario.