Plinius Conference Abstracts,
Vol. 11, Plinius11-148, 2009
11th Plinius Conference on Mediterranean Storms

Analysis and tracking of convective cells over north-western Italy

P. Davini (2), R. Cremonini (1), R. Bechini (1), and C. Cassardo (2)

(1) ARPA Piemonte, Area Previsione e Monitoraggio Ambientale, TORINO, Italy (r.cremonini@arpa.piemonte.it, +39 011 1968 1341), (2) Università degli Studi di Torino, TORINO, Italy

The identification and storm-tracking of convective cells is one of the most interesting sectors of that field of meteorology known as nowcasting. In the present work the main behaviour of the convective cells above North-Western Italy was studied, , using the ARPA Piemonte weather radar.
The analysis carried out evaluates the spatial and temporal distribution of many parameters that characterize convective phenomena, as the properties of the trigger points, the average direction of trackings, their covered distance, their duration and intensity. A relation between the intensity of the storms in the first stages of life and their duration was found: cells that in their first 20 minutes of life do not exceed the 45dBZ-limit have a high probability of dissolving rapidly. A prevalent direction of the convective events was also detected: they move generally North-Eastward. The data so obtained, related with the direction and the intensity of wind provided by radiosounding measurements, allowed to establish that the mid-tropospheric wind is the main elements that rules the movement of the convective cells. Finally, an index, obtained combining the incoming solar radiation and a probability function defined in function of altimetry, was introduced. This index, the Trigger Probability Index, showed a good agreement with the spatial distribution of the trigger points.
All these data were finally used to build a database of statistical interest, able to provide useful information during the nowcasting stage.