



A multianalysis study of a bow echo-like storm in Northeastern Italy

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A bow echo-like storm that affected Northeastern Italy is presented in this work. Noticeable damages and two casualties resulted, mainly due to the strong wind gusts and hail associated with event-related preexisting convection. Several observations and instruments have been used to analyze the storm characteristics and development: meteorological stations network, C-Band Doppler radar, enhanced satellite images, lightning occurrences, hailpads and radiosoundings. Moreover, numerical simulations have been performed with the WRF-ARW model to identify the mesoscale features that favored the development of such a severe storm.

On the one side, the role of cold front features has been highlighted and similarities with other environmental patterns associated with regional severe storms have been explored. On the other side, the role of the strong inflow descending down the Alps, which interacted with the preexisting convection, has been assessed. In particular, the relationship between the ambient wind pattern and the bowed shape of the storm, whose strongest winds and associated funnel clouds were observed at the leading edge, has been analyzed. A simple density current model has been applied to understand the complex flow: theoretical and real wind speeds have been compared.