



Risk assessment for hail episodes in South Eastern Romania

R. D. Cica, S. Burcea, R. Bojariu, and A. Dumitrescu

Administratia Nationala de Meteorologie, Climate Section, Bucharest, Romania (bojariu@meteoromania.ro, +40 21 3162140)

Hail produced by severe convective storms represents a natural hazard, and is of particular interest to the insurance industry. Severe hail can cause damages to cars, buildings, and crops. The hail damage depends on frequency and intensity of the hailfalls. Since the spatial distribution and temporal variations of the hailfalls are strongly localized, ground reports from weather stations should be complemented with other types of information. This study focuses on the combined analysis of data recorded at ground and weather radar measurements. Radar data has the advantage of high spatial and temporal resolutions, resulting in a very feasible option to detect hail in comparison to operational weather stations. The analysis was undertaken on an area in South Eastern Romania which is defined by the total coverage area of the Doppler weather radar system operational at Bucharest. Hail kinetic energy derived from radar reflectivity is used to identify hail on the ground. The hail reports from the weather stations and damage location reports are used for validation. Hail kinetic energy was the main parameter used to reflect the destructive potential of hailfalls. To identify areas at risk of hail damage, maps of hail kinetic spatial distribution were developed. Hail kinetic energy corresponds well with hail recorded at the ground. An additional parameter developed for the identification of areas prone to hail damage is the frequency of detection (FOD) of radar echoes above a certain threshold (e.g., 53 dBZ). FOD maps were constructed for the convective days when hail was detected. Maps of frequency of detection of radar echoes correlates well with the spatial distribution of total hail kinetic energy. This indicates that FOD is a useful parameter in the study of hail damage on properties and crops.