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Radar-derived patterns of convective rainstorms in Eastern Mediterranean and their flooding potential

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Flash floods are often generated by convective storms, and are highly sensitive to space-time properties of these storms. The presentation summarizes several research studies aimed on characterizing patterns of convective storms based on radar data analysis and on focused on better understanding the effect of these patterns on flash flood generation. The studies have been conducted at a range of climatic regimes over Israel in the Eastern Mediterranean: Mediterranean, semi-arid and arid conditions. By extracting, characterizing, and, tracking convective rain cells from radar data we derived probability distributions of rain cell properties, such as: area, orientation, ellipticity, maximal rain intensity, mean rain intensity, movement direction, movement velocity, and more. Furthermore, these probability distributions were derived for different synoptic configurations and significant differences were found between convective cell properties for different prevailing conditions.

By linking convective rain cell data with hydrological models we investigated how rain cell properties affect flash flood magnitude and what are the most influential cell characteristics. A main goal was to understand the conditions at which flash flood magnitude is maximized.