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Desert rain storms and flash floods: Insights gained from space-time characterization of convective rain cells

E. Morin
Hebrew University of Jerusalem, Geography, Jerusalem, Israel (msmorin@mscc.huji.ac.il)

The occurrence of an extreme flash-flood at a given catchment is the final and powerful result of several meteorological and hydrological processes. Rain storm properties, including rain accumulations, rain intensities and space-time distributions, are most important in determining flash flood magnitudes. Catchment properties are also of major importance as they define the catchment-dependent sensitivity of flash-flood generation to rain properties. The presented study looks into these relationships focusing on catchments in the semi-arid and arid regions of the south-eastern Mediterranean. A special attention is given to the space-time rainfall patterns that are derived from meteorological radar data and allow a better view of the rainstorm structure, evolvement and movement in relation to the flooded catchment. The study is conducted through analysis of the highest recorded flash-flood events for which radar data are available. Past studies and new analyses are synthesized to provide more insights into the storm-catchment hydrological interactions during extreme flash flood events.