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An innovative technique for flash flood warning based on wireless communication networks measurements

P. Alpert (1), H. Messer (2), and N. David (3)

(1) The Porter School of Environmental Studies, Tel-Aviv University, Tel-Aviv, Israel (pinhas@post.tau.ac.il), (2) The School of Electrical Engineering, Tel-Aviv University, Tel-Aviv, Israel (messer@eng.tau.ac.il), (3) The Department of Geophysics and Planetary Sciences, Tel-Aviv University, Tel-Aviv, Israel (noamda@post.tau.ac.il)

Flash floods can occur throughout or subsequent to rainfall events, particularly in cases where the precipitation is of high-intensity. The desert of Judah, located in eastern Israel, west of the Dead Sea, has a history of being a flooding area during heavy rains.
One of the main causes of rainfall leading to flooding in the Dead Sea area is the active Red Sea trough – a tropical synoptic scale system. This barometric trough is accompanied by an upper-level trough which develops over Egypt, providing favorable conditions for the development of severe convective storms.
Unfortunately, each year these floods cause severe property damage and heavy casualties.
At present, there are no sufficient real time flash flood warning facilities found at this region. Hence, an efficient warning system is indispensable in order to protect lives and property that are currently at risk.
As was recently proven, commercial microwave links have the ability to monitor precipitation. These links are built close to the ground and operate in a frequency range of tens of GHz. The high resolution microwave links are situated in the southern part of the desert, covering a large area of the potentially flooding site and supplying attenuation measurements every 15 minutes. Therefore, the utilization of these widespread links as an on-line flood warning system can enhance the competence of coping with this hazardous phenomenon.
We present the flash flood warning potential of the wireless communication system for two different cases when floods occurred at the Judean desert. In both cases, an advanced warning regarding the hazard could have been sent to all mobile holders found at the vicinity of the flooding region.